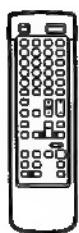


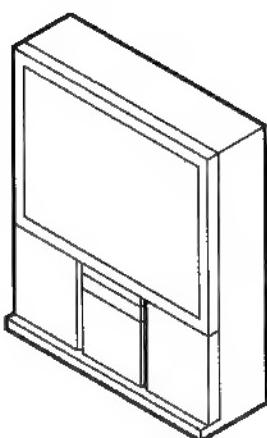
# SERVICE MANUAL

RX-1E CHASSIS

MODEL	COMMANDER	DEST.	CHASSIS NO.	MODEL	COMMANDER	DEST.	CHASSIS NO.
KP-46S4	RM-831	AEP	SCC-N24A-A	KP-53S4	RM-831	AEP	SCC-N24B-A
KP-46S4K	RM-831	OIRT	SCC-N25A-A	KP-53S4K	RM-831	OIRT	SCC-N25B-A
KP-46S4U	RM-831	UK	SCC-N26A-A	KP-53S4U	RM-831	UK	SCC-N26B-A



RM-831



KP-46S4/46S4K/46S4U  
KP-53S4/53S4K/53S4U



\* Please file according to model size. ■

PROJECTION TV  
**SONY**®

## SPECIFICATIONS

Television system	B/G/H,D/K,I,L		
Colour system	PAL/SECAM and NTSC 3.58/NTSC4.43 (VIDEO IN)		
Channel coverage	See " Receivable channels and channel displays " at the bottom.		
Projected picture size	116cm (46 inches)	Front	
Terminals	133cm (53 inches)		
Rear	Center speaker input terminals, 2 terminals ⊕ (L,R), audio outputs - phono jacks (variable) --- --- 1, 21-pin Euro connector (CENELEC standard) -inputs for audio and video signals - inputs for RGB - outputs of TV audio and video signals --- 2/ --- 2, 21-pin Euro connector - inputs for audio and video signals - inputs for S Video - outputs for audio and video signals (selectable) --- 3, S video inputs - 4 pin DIN ⊕ (L,R), audio inputs - phono jacks --- 4/ --- 4, 21-pin Euro connector - inputs for audio and video signals - inputs for S video - outputs for audio and video signals (monitor out)	Sound output	
		Power consumption	225W
		Dimensions(WxHxD)	KP-46S4K : 1104 x 1267 x 512 mm KP-53S4K : 1164 x 1335 x 650 mm
		Weight	KP-46S4K : 79kg KP-53S4K : 90kg
		Supplied accessories	RM-831 Remote Commander One IEC designation R6 battery
		Other features	Digital comb filter (High resolution) PIP (Picture-in-picture) FASTEXT NICAM (B/G, L, I) B/G STEREO D/K STEREO

Design and specifications are subject to change without notice.

### Receivable Channels and Screen Displays

	Receivable channels	Indication on the screen
PAL B/G/H	E2..12 21..69	C02 C03 C04..C12 C21..C69
CABLE TV (1)	S1..41	S01 S02..S41
CABLE TV (2)	S01..S05 M1..M10 U1..U10	S42..S46 S01..S10 S11..S20
ITALIA	A B C D E F G H H1 H2 21..69	C11..C69
SECAM D/K	R01..R12 R21..R60	C02..C12 C21..C60
SECAM L	F2..F10 F21..F69	C01..C12 C21..C69
PAL I	B21.. B68	C21..C68

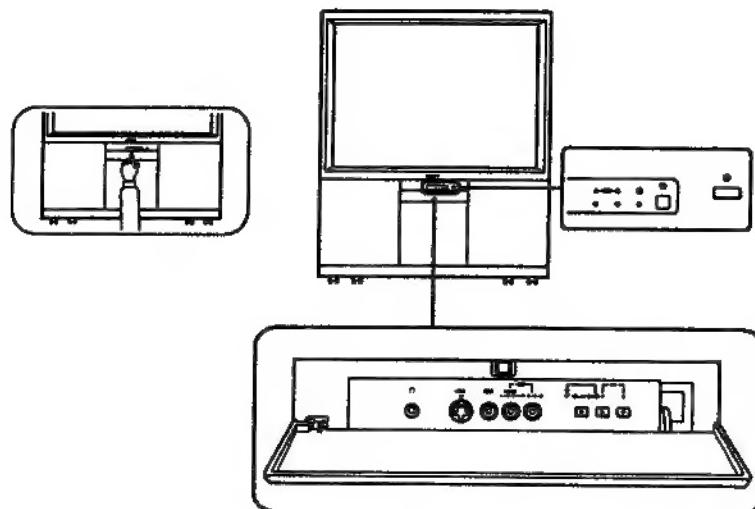
## Overview

### SECTION 1 GENERAL

The operation instruction mentioned here are partial abstracts from the Operating Instruction Manual. The page numbers of the Operating Instruction Manual remain as in the manual.

This section briefly describes the buttons and controls on the TV set and on the Remote Commander. For more information, refer to the pages given next to each description.

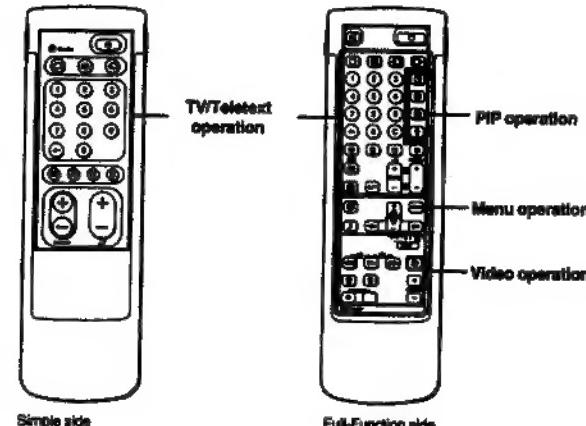
TV set-front



Symbol	Name	Refer to page
①	Main power switch	7, 13
②	Standby indicator	13
A-B	Stereo A/B indicators	15
□	Headphones jack	22
-③ -③ -③	Input jacks (S video/video/audio)	22
F	Function selector (Programme/volume/input)	14
④	Adjustment buttons for function selector	14

TV set-front

Remote commander RM-831



Note  
The SAT button does not operate with this TV.

#### TV/Teletext operation

Symbol	Name	Refer to page
●	Mute on/off button	14
○	Standby button	13
□	TV power on/TV mode selector button	13
■	Teletext button	14
○	Input mode selector	14
○	Output mode selector	23
1,2,3,4,5,6, 7,8,9, and 0	Number buttons	13
+-	Double-digit entering button	13
C	Direct channel entering button	10
△/▽	Volume control button	13
PROGR. +/-	Programme selectors	13
BB	Teletext page access buttons	19
●	Picture adjustment button	15
J	Sound adjustment button	15
□	On-screen display button	14
○	Teletext hold button	19
○	Time display button	14
BBB	Fastext buttons	19

#### PIP (Picture-in-picture) operation

Symbol	Name	Refer to page
○	PIP on/off button	17
t	PIP source selector	17
○	Swap button	17
○	PIP position changing button	17

#### Menu operation

Symbol	Name	Refer to page
MENU	Menu on/off button	7
△/▽	Select buttons	7
OK	OK(confirming)button	7
←	Back button	7

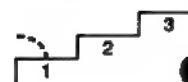
#### Video operation

Symbol	Name	Refer to page
VTR1/2/3	Video equipment selector	24
MOP		
◀ ▶ ▷ ▷	Video equipment operation buttons	24
■ ○		
PROGR. +/-		

# Getting Started



## Step 1 Preparation



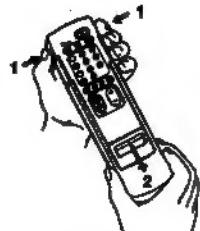
### 1 Check the supplied accessories

When you've taken everything out of the carton, check that you have these items:

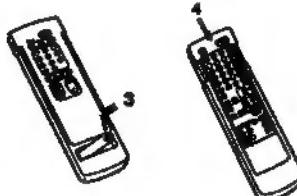
- RM-831 Remote Commander
- One IEC designation R6 battery



### 2 Insert the battery into the Remote Commander



Remove the cover.

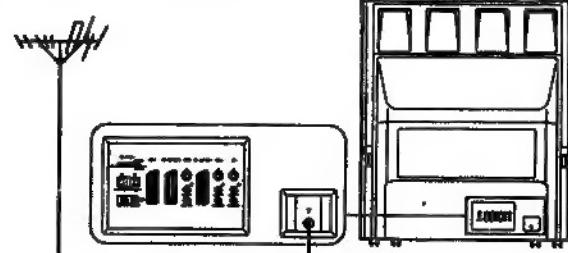


Check the correct polarities.

Re-fit the outside cover making sure that the Full-Function side is visible to use the menu in step 2.

Note: Always remember to dispose of used batteries in an environmental friendly way.

### 3 Connect the aerial



Fit an IEC aerial connector attached to 75-ohm coaxial cable (not supplied) to the 'T' socket at the rear of the TV.

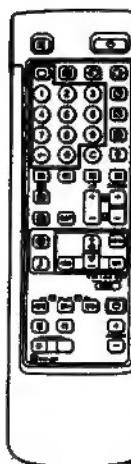
## Step 2 Adjusting Colour Registration (CONVERGENCE)



Once you have set up the TV, you can choose the language of the menu. Then you should converge the three colour layers (red, green, and blue).

### Before you begin

- Check that the Full-Function side of the Remote Commander is visible.
- Locate Menu operation buttons on the Remote Commander. They are shaded in the illustration at the left.



### 1 Choose a language

- 1 Depress ① (main power switch) on the TV unit. The TV will switch on. If the standby indicator on the TV is lit, press ② or a number button on the Remote Commander.
- 2 Press MENU. The LANGUAGE menu appears. (See Fig. 1.)
- 3 Select the language you want with  $\Delta$  + or  $\nabla$  – and press OK.
- 4 Press  $\leftrightarrow$  to return to the main menu.



SELECT LANGUAGE  
► ENGLISH  
DEUTSCH  
FRANÇAIS  
ESPAÑOL  
NEDERLANDS  
ESPÀOL  
SELECT 2 2 AND PRESS OK

Fig. 1

### 2 Display the menu

- Press MENU.  
The main menu appears. (See Fig. 2.)



MAIN MENU  
► PICTURE  
SOUND  
FEATURES  
CONVERGENCE  
SETUP  
LANGUAGE  
SELECT 2 2 AND PRESS OK

Fig. 2

### 3 Converge the red, green and blue lines

- 1 Select "CONVERGENCE" with  $\Delta$  + or  $\nabla$  – and press OK. The CONVERGENCE menu appears. (See Fig. 3.)
- 2 Select "the line" you want to adjust with  $\Delta$  + or  $\nabla$  –. Key to line adjustment symbols:  
I (red vertical – left/right adjustment)  
– (red horizontal – up/down adjustment)  
1 (blue vertical – left/right adjustment)  
– (blue horizontal – up/down adjustment)
- 3 Press OK. The line to adjust is selected.
- 4 Press  $\Delta$  + or  $\nabla$  – to converge the selected line with the centre green line and press OK.

To move up (horizontal line)	Press $\Delta$ +
To move right (vertical line)	Press $\Delta$ +
To move down (horizontal line)	Press $\nabla$ –
To move left (vertical line)	Press $\nabla$ –

- 5 Repeat steps 2 to 4 to adjust the other lines, until all the lines have overlapped to form a white cross. (See Fig. 4.)
- 6 Press MENU to return to TV picture.

CONVERGENCE  
► + + + + +  
SELECT 2 2 AND PRESS OK

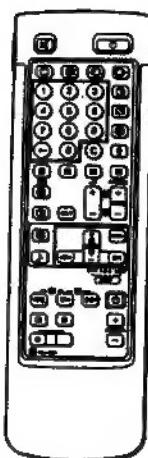
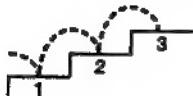
Fig. 3

CONVERGENCE  
► + + + + +  
SELECT 2 2 AND PRESS OK

Fig. 4

Mixture of Primary Colours

## Step 3 Tuning in to TV Stations



To go back to the main menu  
Keep pressing ← .

To stop automatic channel presetting  
Press ← on the Remote Commander.

**Notes**  
After presetting the channels automatically, you can check which channels are stored on which programme positions.

You can exchange the programme positions to have them appear on screen in the order you like. For details, see "Exchanging the Programme Positions" on page 10.

You can preset the channels (up to 100 channels) by choosing either the automatic or manual method. The automatic method is easier if you want to preset all receivable channels at once. Use the manual method if you only have a few channels and want to preset channels one by one.



### Preset Channels Automatically

- 1 Press MENU to display the main menu.
- 2 Select "PRESET" with Δ+ or ∇- and press OK. The PRESET menu appears. (See Fig. 5.)
- 3 Select "AUTO TUNING" with Δ+ or ∇- and press OK. The AUTO TUNING menu appears. (See Fig. 6.)
- 4 Select the programme with ← → and enter the digit numbers from which you want to start presetting.
- 5 Press OK. Select if necessary the TV broadcast system with Δ+ or ∇- and press OK. (BG for western European countries, DK for eastern European countries, L for France and I for the United Kingdom.)
- 6 Using Δ+ or ∇-, select C (to start presetting regular channels) or S (to start presetting cable channels) and press OK. The automatic channel presetting starts.
- 7 When presetting is finished, the preset menu reappears. All available channels are now stored on successive number buttons. If you want to change to another broadcasting system, repeat steps 3 to 5.
- 8 Press MENU to return to TV picture.



Fig. 5



Fig. 6

Use this method if there are only a few channels in your area to preset or if you want to preset channels one by one.

If you have made a mistake  
Press ← → to go back to the previous position.

To return to the main menu  
Keep pressing ← .

### Preset Channels Manually

- 1 Press MENU to display the main menu.
- 2 Select "PRESET" with Δ+ or ∇- and press OK. (See Fig. 7.)
- 3 Select "MANUAL TUNING" with Δ+ or ∇- and press OK. The MANUAL TUNING menu appears. (See Fig. 8.)
- 4 Using Δ+ or ∇-, select the programme position to which you want to preset a channel, and press OK. You can also select the programme position with the number buttons (e.g. for programme 24, press →, 2 and 4).
- 5 Select, if necessary, the TV broadcast system (BG for western European countries, DK for eastern European countries, L for France and I for the United Kingdom) with Δ+ or ∇-. Then press OK.
- 6 Using Δ+ or ∇-, select C (to start presetting regular channels) or S (to start presetting cable channels) and press OK.
- 7 Press Δ+ or ∇- until the channel you want appears on the screen. You can also select the channel directly using the number buttons. Press C (once for VHF/UHF channels, twice for cable TV channels), then the number buttons (e.g., for channel 5, press 0 and 5). Then press OK.

#### To preset other channels

Repeat steps 4 to 7.

#### To return to TV picture

Press MENU.



Fig. 7

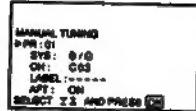


Fig. 8

# Additional Presetting Functions



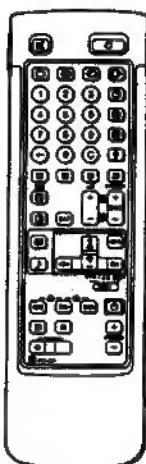
This section shows you additional presetting functions such as exchanging or skipping programme positions, captioning a station name, and manual fine-tuning.

You can skip this section, if not needed.

## Before you begin

- Check that the Full Function side of the Remote Commander is visible.
- Locate the Menu operation buttons.

### PROGRAMME EXCHANGE



If you have made a mistake  
Press ← to go back to the previous position.  
To go back to main menu  
Keep pressing ←.

## Exchanging Programme Positions

With this function, you can exchange the programme positions to a preferable order.

- Press MENU to display the main menu.
- Select "PRESET" with Δ+ or Δ- and press OK. The PRESET menu appears.
- Select "PROGRAMME EXCHANGE" with Δ+ or Δ- and press OK. The PROGRAMME EXCHANGE menu appears. (See Fig. 8.)
- Using Δ+ or Δ-, select the programme position you want to exchange with another and press OK.
- Using Δ+ or Δ-, select the programme position to be exchanged and press OK. Now the two programme positions have been exchanged.
- Repeat steps 4 and 5 to exchange other programme positions.
- Press MENU to return to TV picture.



Fig. 8

## Tuning in to a Channel Temporarily

You can tune in to a channel temporarily, even when it has not been preset. Use the buttons on the Full-Function side of the Remote Commander.

- Press C on the Remote Commander for regular channels, or twice to get cable channels. The indication "C" ("S" for cable channels) appears on the screen. (See Fig. 10.)
- Enter the double-digit channel number using the number buttons (e.g. for channel 4, first press 0, then 4). The channel appears. However, the channel will not be stored.

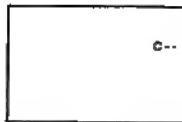


Fig. 10

### LOADING SYSTEM

## Skipping Programme Positions

You can skip unused programme positions when selecting programmes with the PROGR +/- buttons. However, the skipped programmes may still be called up when you use the number buttons.

- Press MENU to display the main menu.
- Select "PRESET" with Δ+ or Δ- and press OK. The PRESET menu appears.
- Select "MANUAL TUNING" with Δ+ or Δ- and press OK. The MANUAL TUNING menu appears. (See Fig. 11.)
- Using Δ+ or Δ-, select the programme position which you want to skip and press OK.
- Press Δ+ or Δ- until "---" appears in the SYS position. (See Fig. 12.)
- Press OK. When you select programmes using the PROGR +/- buttons, the programme position will be skipped.
- Repeat steps 4 to 6 to skip other programme positions.
- Press MENU to return to TV picture.

### PRESET

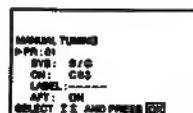


Fig. 11

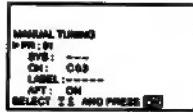


Fig. 12

### MANUAL TUNING

You can "name" a channel using up to five characters (letters or numbers) to be displayed on the TV screen (e.g. BBC1). Using this function, you can easily identify which channel you are watching.

- Press MENU to display the main menu.
- Select "PRESET" with Δ+ or Δ- and press OK. The PRESET menu appears.
- Select "MANUAL TUNING" with Δ+ or Δ- and press OK. The MANUAL TUNING menu appears.
- Select "PR" with Δ+ or Δ- and press OK.
- Select programme position you want to caption with Δ+ or Δ- and press OK.
- Select "LABEL" with Δ+ or Δ- and press OK.
- Select a letter or number with Δ+ or Δ- and press OK. Select other characters in the same way. If you want to leave an element blank, select - and press OK. (See Fig. 13.)
- Repeat steps 4 to 7 to caption names for other channels.
- Press MENU to return to TV picture.

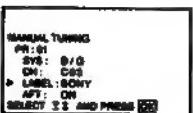


Fig. 13

## MANUAL TUNING

### Manual Fine-Tuning

Normally, the AFT (automatic fine-tuning) is already operating. However, if the picture is distorted, you can use the manual fine tuning function to obtain better picture reception.

- 1 Press MENU to display the main menu.
- 2 Select "PRESET" with  $\Delta+$  or  $\nabla-$  and press OK. The PRESET menu appears.
- 3 Select "MANUAL TUNING" with  $\Delta+$  or  $\nabla-$  and press OK. The MANUAL TUNING menu appears.
- 4 Select "PR" with  $\Delta+$  or  $\nabla-$  and press OK.
- 5 Select programme position you want to manually fine-tune with  $\Delta+$  or  $\nabla-$  and press OK.
- 6 Select "AFT" with  $\Delta+$  or  $\nabla-$  and press OK.
- 7 Select "OFF" with  $\Delta+$  or  $\nabla-$  and press OK. (See Fig. 14.)
- 8 Fine-tune the channel with  $\Delta+$  or  $\nabla-$  so that you get the best TV reception. As you press the cursor buttons, the frequency changes from -128 to +127.
- 9 After fine tuning, press OK. Now the fine-tuned level is stored.
- 10 Repeat steps 4 to 9 to fine-tune other channels.
- 11 Press MENU to return to TV picture.

To deactivate AFT  
(automatic fine tuning)  
Repeat from the  
beginning and select  
"ON" in step 7.

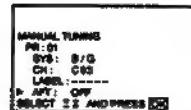
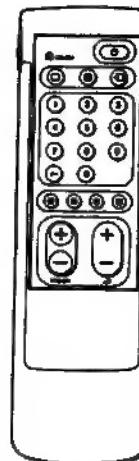


Fig. 14

# Operating Instructions

## Watching the TV



If no picture appears when you depress  $\odot$  on the TV and if the standby indicator on the TV is lit, the TV is in standby mode. Press  $\odot$  or one of the number buttons to switch it on.

This section explains the basic functions you use while watching TV. Most of the operations can be done using the simple side of the Remote Commander.

### Switching the TV on and off

#### Switching on

Depress  $\odot$  (main power switch) on the TV unit.

#### Switching off temporarily

Press  $\odot$  on the Remote Commander.

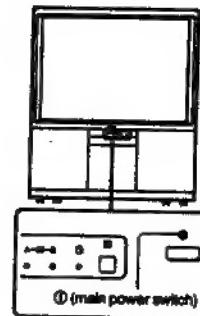
The TV enters standby mode and the standby indicator on the front of the TV lights up.

#### To switch on again

Press  $\odot$ , PROGR +/-, or one of the number buttons on the Remote Commander.

#### Switching off completely

Depress  $\odot$  (main power switch) on the TV unit.



### Selecting TV Programmes

Press PROGR +/- or press the number buttons.

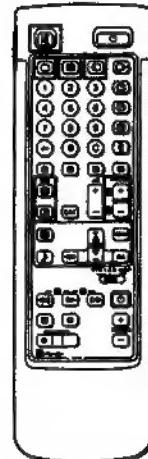
#### To select a double-digit number

Press +/-, then the numbers.

For example, if you want to choose 23, press +/-, 2, and 3.

### Adjusting the Volume

Press  $\Delta$  +/-.



For details of the teletext operation, refer to page 19.

For details of the video input picture, refer to page 23.

## Operating the TV Using the Buttons on the TV

With the  $\leftarrow\rightarrow$  buttons on the TV, you can select programmes, adjust the volume, and select video input sources.

**To switch on the TV from the standby mode**  
Press the  $\leftarrow\rightarrow$  buttons.

**To reset picture and sound controls to the factory preset level (RESET function)**  
Press the  $\leftarrow\rightarrow$  buttons simultaneously.

**To select TV programmes**

Press  $\leftarrow\rightarrow$  repeatedly until the  $\square$  (programme number) appears, then press the  $\leftarrow\rightarrow$  button to select.

**To adjust the volume**

Press  $\leftarrow\rightarrow$  repeatedly until the  $\square$  (volume indication) appears, then press the  $\leftarrow\rightarrow$  button to adjust. (See Fig. 15.)

**To select video input source**

Press  $\leftarrow\rightarrow$  repeatedly until the  $\square$  (video input indication) appears, then press the  $\leftarrow\rightarrow$  button to select. Each pressing the button, the indication changes as follows.

AV1—RGB—AV2—YC2  
↓  
YC4—AV4—YC3—AV3

After the video input source is selected, the  $\square$  appears. Press the  $\leftarrow\rightarrow$  button to adjust the volume. (See Fig. 16.)

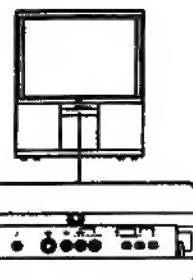


Fig. 15



Fig. 16

## Watching Teletext or Video Input

### Watching teletext

- 1 Press  $\odot$  to view the teletext.
- 2 For teletext operation, enter a 3-digit page number with the number buttons to select a page.
- For teletext operation, press one of the coloured buttons.
- For both operations, press  $\odot$  (PAGE +) for the next page or  $\odot$  (PAGE -) for the preceding page.
- 3 To go back to the normal TV picture, press  $\odot$ .

### Watching a video input picture

- 1 Press  $\leftarrow\rightarrow$  repeatedly until the desired video input appears.
- 2 To go back to the normal TV picture, press  $\odot$ .

## More Convenient Functions

Use the Full-Function side of the Remote Commander.

### Displaying the on screen indications

- Press  $\odot$  once to display all the indications.
- Press  $\odot$  again to make the indications disappear.

### Muting the sound

Press  $\odot$ .  
To resume normal sound, press  $\odot$  again.

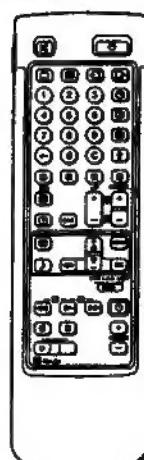
### Displaying the time

Press  $\odot$ . This function is available only when teletext is broadcast.  
To make the time display disappear, press  $\odot$  again.

## Adjusting and Setting the TV Using the Menu

### PICTURE

### SOUND



## Adjusting the Picture and Sound

Although the picture and sound are adjusted at the factory, you can adjust them to suit your own taste. You can also select dual sound (bilingual) programmes when available or adjust the sound for listening with the headphones.

- 1 Press  $\odot$  (for picture) or  $\odot$  (for sound) on the remote Commander, or  
Press MENU and select "PICTURE" or "SOUND," then press OK. The PICTURE ADJUSTMENT or SOUND ADJUSTMENT menu appears.  
(See Fig. 17 or Fig. 18.)
- 2 Using  $\Delta$  or  $\nabla$ , select the item you want to adjust and press OK. To move up/down:  
From  $\square$  position, press  $\nabla$  to move down.  
From  $\square$  position, press  $\Delta$  to move up.  
 $\square$  means next page.  
 $\square$  means previous page.
- 3 Adjust the setting with  $\Delta$  or  $\nabla$  and press OK.  
For the effect of each control, see the table below.
- 4 Repeat steps 2 and 3 to adjust other items.
- 5 Press MENU to return to TV picture.

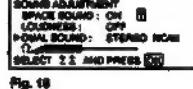
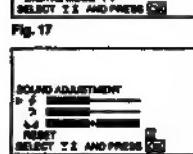


Fig. 17



Fig. 18

### Effect of each control

PICTURE ADJUSTMENT	Effect
$\square$ (contrast)	Less  More
$\square$ (brightness)	Darker  Brighter
$\square$ (colour)	Less  More
$\square$ (hue)	Greenish  Reddish
$\square$ (sharpness)	Softer  Sharper
RESET	Resets picture to the factory preset levels.
NOISE REDUCE	OFF: Normal ON: When reducing the picture noise.
DIGITAL MODE	1: Line Flicker reduction on. 2: Line Flicker reduction off.

SOUND ADJUSTMENT	Effect
$\square$ (Tone)	Less  More
$\square$ (Bass)	Less  More
$\square$ (Balance)	More left  More right
RESET	Resets sound to the factory preset levels.
SPACE SOUND	OFF: Normal ON: Obtain acoustic sound effect.
LOUDNESS	OFF: Normal ON: When listening to low volume sound.
DUAL SOUND*	A: left channel B: right channel Stereo mono STEREO $\leftrightarrow$ MONO The selected mode of the A-CD-B indicator on the TV lights up.
$\square$ (Headphones)	Less

\*When receiving a NICAM programme

NICAM stereo/monaural  $\rightarrow$  STEREO NICAM  $\rightarrow$  MONO

NICAM bilingual  $\rightarrow$  NICAM A  $\rightarrow$  NICAM B  $\rightarrow$  MONO

# PIP (Picture In Picture)

GB

## FEATURES

### Using the SLEEP TIMER

You can select a time period after which the TV automatically switches into standby mode.

- 1 Press MENU to display the main menu.
- 2 Select "FEATURES" with  $\Delta+$  or  $\nabla-$  and press OK. The FEATURES menu appears.
- 3 Select "SLEEP TIMER" with  $\Delta+$  or  $\nabla-$  and press OK. (See Fig. 19.) The time period option changes colour.
- 4 Select the time period with  $\Delta+$  or  $\nabla-$ . The time period changes as follows:  
OFF  $\rightarrow$  0:30  $\rightarrow$  1:00  $\rightarrow$  1:30  $\rightarrow$  2:00
- 5 After selecting the time period, press OK. The cursor moves back to the left margin and the timer starts counting. One minute before the TV switches into standby mode, a message is displayed on the screen.
- 6 Press MENU to return to TV picture.



Fig. 19

To switch off the timer  
Select "OFF" in step 3.

To check the remaining time  
Press  $\square$ .

## FEATURES

### PARENTAL LOCK

You can prevent undesirable broadcasts from appearing on the screen. We suggest you use this function to prevent children from watching programmes which you consider unsuitable.

- 1 Select the TV programme which you want to block.
- 2 Press MENU to display the main menu.
- 3 Select "FEATURES" with  $\Delta+$  or  $\nabla-$  and press OK. The FEATURES menu appears.
- 4 Select "PARENTAL LOCK" with  $\Delta+$  or  $\nabla-$  and press OK.
- 5 Select "ON" with  $\Delta+$  or  $\nabla-$  and press OK. (See Fig. 20.)
- 6 Press MENU to return to TV picture.

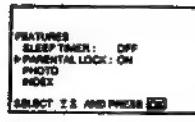
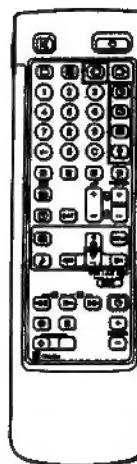


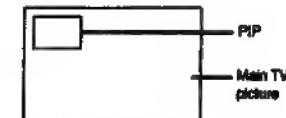
Fig. 20

If you try to select a programme that has been blocked  
The message  
"LOCKED" appears on the blank TV screen.



Note  
RGB input source  
cannot be displayed in  
PIP.

With this function you can display a "PIP screen" (small picture) within the main TV picture. In this way you can watch or monitor the video output from any connected equipment (for example from a VTR) while watching TV or vice versa. For information about connection of other equipment, refer to page 22.



#### Switching PIP on and off

Press  $\square$ .  
The PIP screen will be displayed. The PIP picture will come from the source chosen when the TV was last used.

To switch PIP off  
Press  $\square$  again.

#### Selecting a PIP source

- 1 Press  $\square$ .  
The symbol  $\square$  will be displayed at the bottom, left-hand corner of the screen.
- 2 Press  $\square$  repeatedly until the desired PIP source is indicated (e.g. TV, AV1, AV2, YC2, AV3, YC3, AV4, YC4).

Note  
If no video source has been connected, the PIP picture will be noisy.

#### Swapping screens

Press  $\square$ .  
The main screen will switch the picture with the PIP screen.

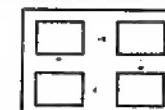


#### Notes

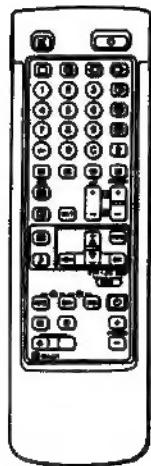
- If a TV programme is on the PIP screen and a video source on the main picture, and you want to change channels, first press  $\square$  and then the programme number buttons or PROGR +/-.
- Swapping screens takes about 2 seconds after pressing  $\square$ .
- After swapping screens if the colour systems of the main and PIP pictures are different, the PIP picture first appears in black and white and then in colour.

#### Changing the position of the PIP

Press  $\square$  repeatedly to change the position of the PIP screen within the main screen. There are four different positions available.



## FEATURES



### Displaying Frame-by-frame Pictures (PHOTO)

- 1 Press MENU to display the main menu.
- 2 Select "FEATURES" with  $\Delta+$  or  $\nabla-$  and press OK. The FEATURES menu appears. (See Fig. 21.)
- 3 Select "PHOTO" with  $\Delta+$  or  $\nabla-$  and press OK. (See Fig. 22.) The preset programme is displayed in nine separated screen in sequence. (See Fig. 23.)

#### To restore the normal picture

Press OK and MENU.



Fig. 21

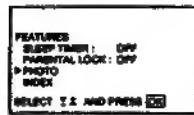


Fig. 22



Fig. 23

### Checking All the Preset Programmes (INDEX)

- 1 Press MENU to display the main menu.
- 2 Select "FEATURES" with  $\Delta+$  or  $\nabla-$  and press OK. The FEATURES menu appears. (See Fig. 24.)
- 3 Select "INDEX" with  $\Delta+$  or  $\nabla-$  and press OK. (See Fig. 25.) The nine preset programmes appear in the separated screen in sequence, switching the picture for each second. After all the nine programmes are displayed, each sequence switch the picture with the sound for each five seconds. Press  $\Delta+$  also switches to the next nine programmes. (See Fig. 26.)

#### To restore the normal picture

Press OK and MENU.



Fig. 24

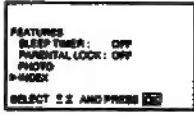


Fig. 25

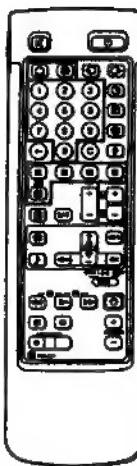


Fig. 26

## Teletext

TV stations broadcast an information service called Teletext via the TV channels. Teletext service allows you to receive various information pages such as weather reports or news at any time you want. For advanced teletext operation, use the buttons on the Full-Function side of the Remote Commander.

GB



### Direct Access Functions

#### Switching Teletext on and off

- 1 Select the TV channel which carries the teletext broadcast you want to watch.
- 2 Press  $\text{OK}$  to switch on teletext. A teletext page will be displayed (usually the Index page). If there is no teletext broadcast, "No text available" is displayed on the information line at the top of the screen.

#### To switch teletext off

Press  $\text{OK}$ .

#### Selecting a teletext page

##### With direct page selection

Use the number buttons to input the three digits of the chosen page number.  
If you have made a mistake, type in any three digits. Then re-enter the correct page number.  
If the requested page is not available at that moment, a message will be displayed.

##### Accessing next or preceding page

Press  $\text{PAGE+}$  or  $\text{PAGE-}$ .  
The next or preceding page appears.

##### Superimposing the teletext display on the TV programme

- Press  $\text{OK}$  once in teletext mode or twice in TV mode.
- Press  $\text{OK}$  again to resume normal teletext reception.

##### Preventing a teletext page from being updated

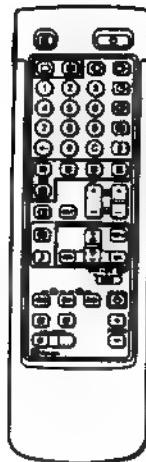
- Press  $\text{HOLD}$  (HOLD). The HOLD symbol "H" is displayed on the information line.
- Press  $\text{OK}$  to resume normal teletext reception.

#### Using Fastext

##### With Fastext you can access pages with one key stroke.

When a Fastext page is broadcast, a colour-coded menu will appear at the bottom of the screen. The colours of this menu correspond to the red, green, yellow and blue buttons on the Remote Commander.

Press the corresponding coloured button on the Remote Commander which corresponds to the colour-coded menu. The page will be displayed after a few seconds.



Note  
Some of the features  
may not be available  
depending on the  
teletext service.

## Using the Teletext Menu

This TV is provided with a menu-guided teletext system. When teletext is switched on, you can use the menu buttons to operate the teletext menu. Select the teletext menu functions in the following way:

- 1 Press MENU. The menu will be superimposed on the teletext display. (See Fig. 27.)
- 2 Using ▲ or ▼, select the teletext function you want and press OK.

### INDEX

The index will give you an overview of the contents of the teletext, and the page numbers.

### ENLARGING

For convenient reading of a teletext page, you can enlarge the teletext display with the ability to scroll up and down. After having selected the function, an information line TOP/BOTTOM/FULL will be displayed. (See Fig. 28.)

To enlarge the upper half with "TOP," select "TOP" and hold down the ▼. To enlarge the lower half with "BOTTOM," select "BOTTOM" and hold down the △. The picture can be scrolled up to 12 steps in each direction. Press OK for "FULL" to resume the normal size.

Press ⓧ to resume normal teletext reception.

### TEXT CLEAR

After selecting the function, you can watch a TV programme while waiting for a teletext page to be displayed. (See Fig. 29.)

Press ⓧ to resume normal teletext reception.

### SUBTITLES

Your teletext service will inform you if a TV programme is subtitled. After having selected the function the subtitles will be displayed.

### REVEAL

Sometimes pages contain concealed information, such as answers to a quiz. The REVEAL option lets you disclose the information. After having selected the function, concealed information will be displayed.

By choosing REVEAL again on the menu, the concealed information will be canceled.

Press ⓧ to resume normal teletext reception.



Fig. 27



Fig. 28



Fig. 29

Press OK to select  
"OFF" for the TIME  
PAGE setting to cancel  
the request.

To cancel the request  
Select SURPAGE and  
press OK.

NOTE:  
"TIME PAGE" and  
"SURPAGE" features  
may not be available  
depending on the  
teletext service.

## TIME PAGE

Your teletext service will inform you, if a time coded page is available. You may have a page (e.g. an alarm page) displayed at a certain time.

- 1 Using △+ or ▽-, select "ON." Press OK. The TV programme you were watching before you selected TIME PAGE is restored. An information window will be displayed at the bottom of the page.
- 2 To select the desired page, enter three digits for the page number (e.g. 452) using the number buttons and press OK.
- 3 To select the desired time, enter four digits for the desired time (e.g. 1800) using the number buttons and press OK. The selected time is displayed at the top in the left-hand corner. At the requested time, the page will be displayed. Press ⓧ to resume normal teletext mode.

### SURPAGE

You may want to select a particular teletext page from several subpages which are rotated automatically. After having selected the function, an information line will be displayed.

To select the desired subpage, enter four digits using PROG +/- or the number buttons (e.g. enter 0002 for the second page of a sequence).

# Connecting and Operating Optional Equipment

## Connecting Optional Equipment

You can connect optional audio-video equipment to this TV such as a VCR, video disc player, and stereo system.

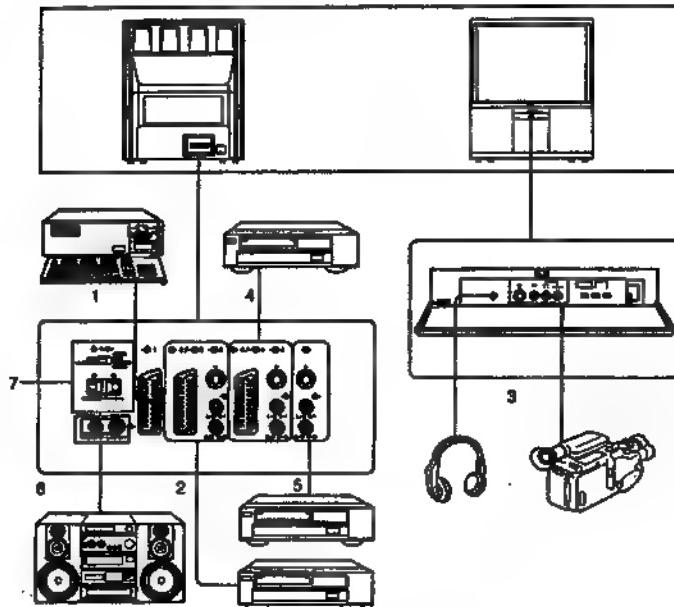
To connect a VCR using the "T" terminal  
Connect the serial output of the VCR to the serial terminal "T" of the TV.

We recommend that you tune in the video signal to programme number "1". For details see "Preselect channels" on page 9.

If the picture or the sound is distorted  
Move the VCR away from the TV.

**SVIDEO Input (Y/C input)**  
Video signals may be separated into Y (luminance or brightness) and C (chrominance) signals. Separating the Y and C signals prevents them from interfering with one another, and therefore improves picture quality (especially luminance). This TV is equipped with 3 S Video input jacks through which these separated signals can be input directly.

When connecting a monaural VCR  
Connect only the white - $\odot$  jack to both the TV and VCR.



### Acceptable Input Signal

- 1 Normal audio/video and RGB signal
- 2 Normal audio/video and S video signal
- 3 Normal audio/video and 3 video signal
- 4 Normal audio/video and 3 video signal
- 5 No inputs

- 6 No inputs
- 7 Centre speaker input.  
Select to CENTRE when TV set's speakers are used for external amplifier (e.g. Dolby amplifier).  
For normal operation, switch position is MUTE.

### Available Output Signal

- |   |  |
|---|--|
| 1 | Video/audio from TV tuner                                |
| 2 | Video/audio from selected source                         |
| 3 | No outputs   |
| 4 | Video/audio displayed on TV screen (monitor out)         |
| 5 | Svideo/audio signal displayed on TV screen (monitor out) |
| 6 | Audio signal (variable)                                  |
| 7 | No outputs   |



- $\odot$ 1 connector always outputs the audio and video signals from the "T" serial terminals.

- $\odot$ 4- $\odot$ 4 connector always outputs the audio and video signals which you are currently watching on the TV screen (i.e. monitor output).

## Selecting Input

This section explains how to view the video input picture (of the video source connected to your TV).

Press - $\odot$  repeatedly to select the input source.

The symbol of the selected input source will appear. (See Fig. 30.)

To go back to the normal TV picture  
Press  $\odot$ .



Fig. 30

Symbol	Input signal
- $\odot$ 1	Audio/Video input through the - $\odot$ 1 connector
- $\odot$	Audio/RGB input through the - $\odot$ 1 connector
- $\odot$ 2	Audio/Video input through the - $\odot$ 2/- $\odot$ 2 connector
- $\odot$ 3	Audio/S video input through the - $\odot$ 3/- $\odot$ 3 or - $\odot$ 3/- $\odot$ 3 connector (4-pin connector)
- $\odot$ 3	Audio/S video input through the - $\odot$ 3 (4-pin connector) and - $\odot$ 3 connectors
- $\odot$ 4	Audio/Video input through the - $\odot$ 4/- $\odot$ 4 connector
- $\odot$ 4	Audio/S video input through the - $\odot$ 4/- $\odot$ 4 or - $\odot$ 4/- $\odot$ 4 connector(4-pin connector)

You can also select the input mode using the - $\odot$  and - $\odot$  buttons on the TV. In this case, first select - $\odot$ , and then press - $\odot$  buttons to select the input.

## Selecting Output from the - $\odot$ 2/- $\odot$ 2 Connector

You can select the output signal from the - $\odot$ 2/- $\odot$ 2 connector. The - $\odot$ 2/- $\odot$ 2 connector outputs the input signals from the other connections as indicated below.

Press  $\odot$  repeatedly to select the output.

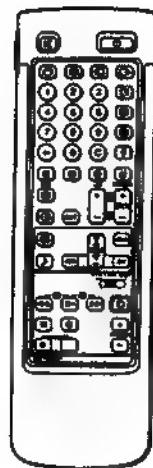
The symbol of the selected output source appears. (See Fig. 31.)



Fig. 31

Symbol	Output signal of the - $\odot$ 2/- $\odot$ 2 connector
1 - $\odot$	Audio/video signal from the - $\odot$ 1 connector
2 - $\odot$	Audio/video signal from the - $\odot$ 2/- $\odot$ 2 connector
3 - $\odot$	Audio/S video signal from the - $\odot$ 2/- $\odot$ 2 or - $\odot$ 2/- $\odot$ 2 connector (4 pin)
3 - $\odot$	Audio/video signal from the - $\odot$ 3/- $\odot$ 3 connectors
4 - $\odot$	Audio/video signal from the - $\odot$ 3/- $\odot$ 3 connectors
4 - $\odot$	Audio/Video signal from the - $\odot$ 4/- $\odot$ 4 connector
TV - $\odot$	Audio/S video signal from the - $\odot$ 4/- $\odot$ 4 or - $\odot$ 4/- $\odot$ 4 connector (4 pin)
TV - $\odot$	Audio/Video signal from the "T" serial terminal

## For Your Information



### Remote Control of Other Sony Equipment

You can use the TV Remote Commander to control most of Sony remote-controlled video equipment such as: Beta, 8 mm and VHS VCRs and video disc players.

#### Tuning the Remote Commander to the equipment

- 1 Set the VTR 1/2/3 MDP selector according to the equipment you want to control:  
VTR 1: Beta VCR  
VTR 2: 8 mm VCR  
VTR 3: VHS VCR  
MDP: Video disc player
- 2 Use the buttons indicated in the illustration to operate the additional equipment.  
If your video equipment is furnished with a COMMAND MODE selector, set this selector to the same position as the VTR 1/2/3 MDP selector on the TV Remote Commander.  
If the equipment does not have a certain function, the corresponding button on the Remote Commander will not operate.

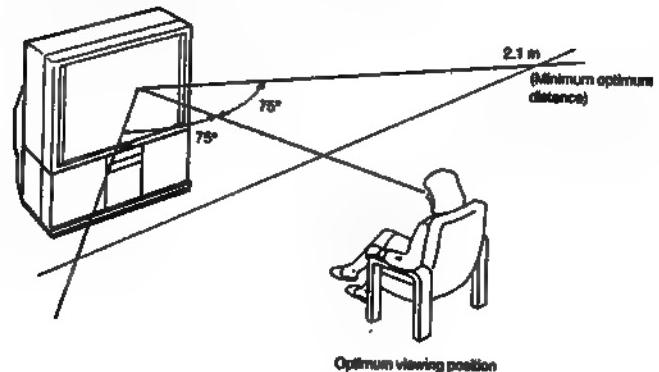
When recording  
When you use the (record) button, make sure to press this button and the one to the right of it simultaneously.

### Optimum Viewing Area

For the best picture quality, try to position the projection TV so that you can view the screen from within the areas shown below.

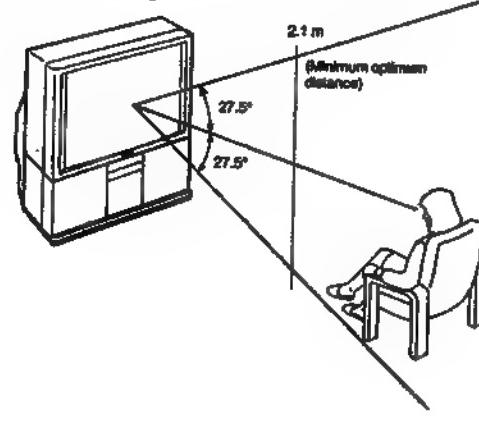
GB

#### Horizontal viewing area



Optimum viewing position

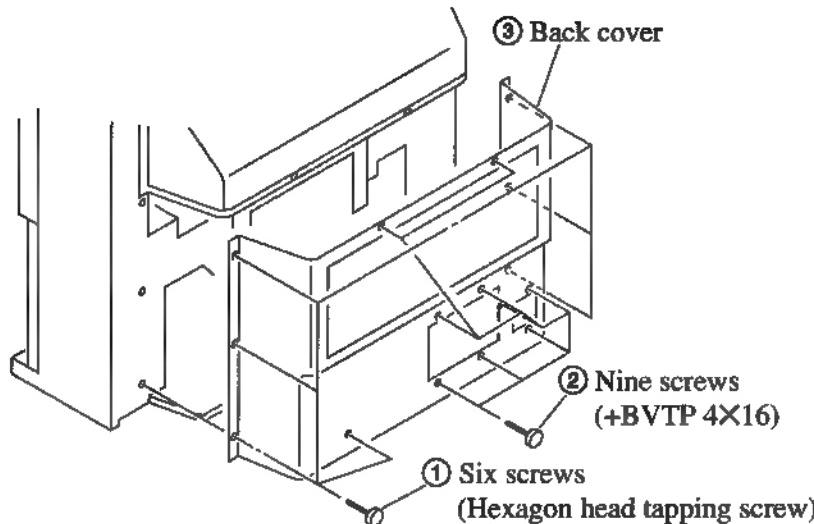
#### Vertical viewing area



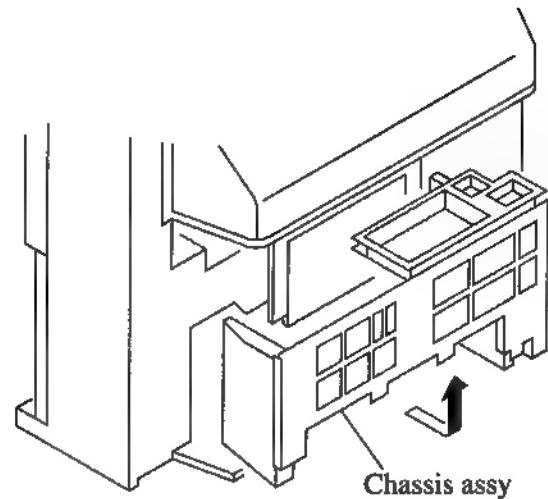
Optimum viewing position

## SECTION 2 DISASSEMBLY

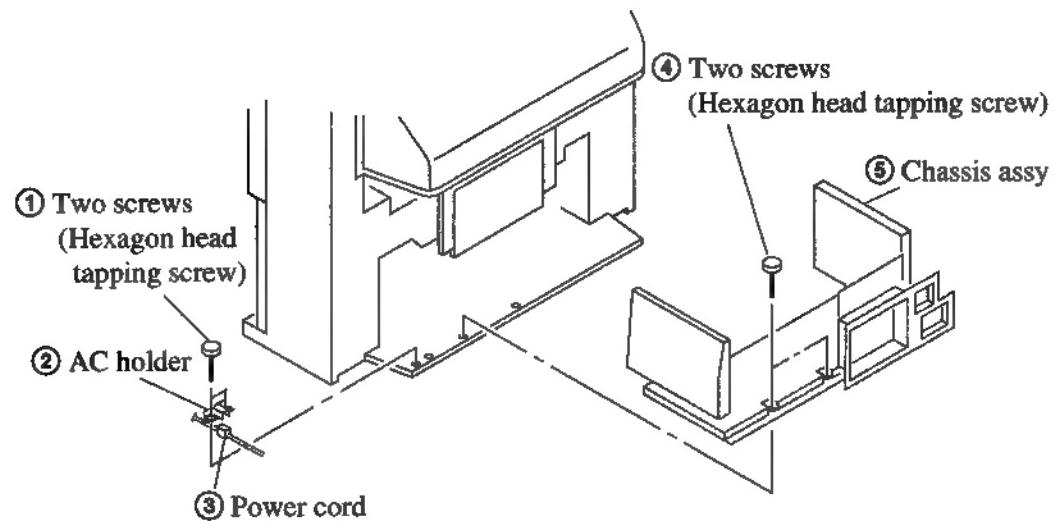
2-1-1. BACK COVER REMOVAL



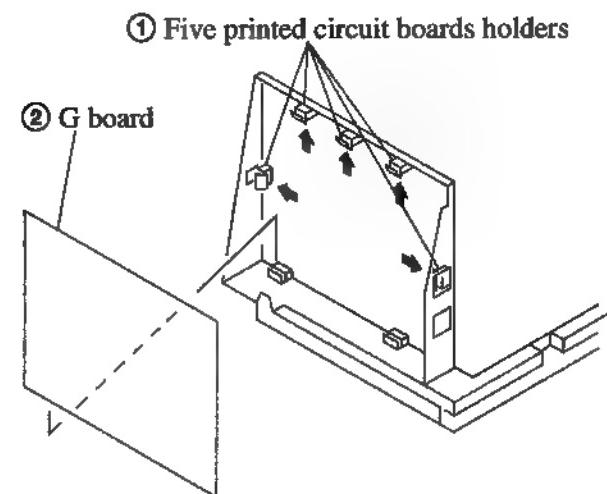
2-1-3. SERVICE POSITION



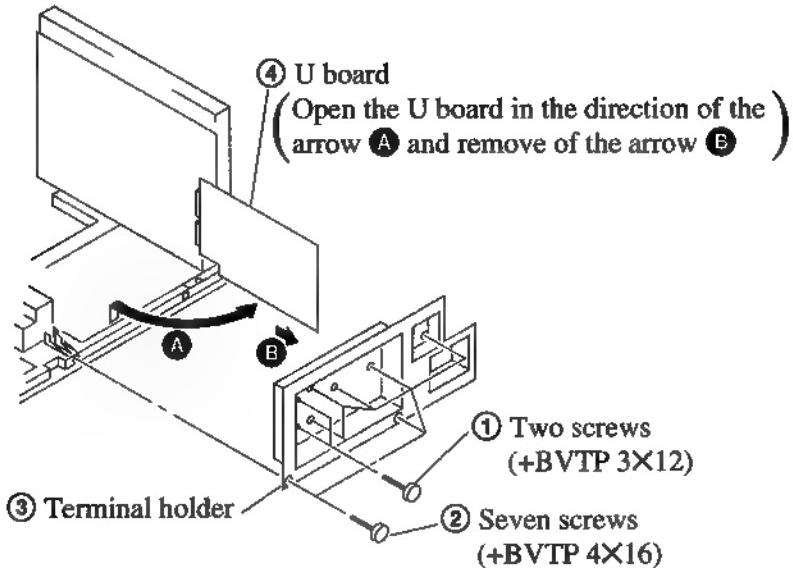
2-1-2. CHASSIS ASSY REMOVAL



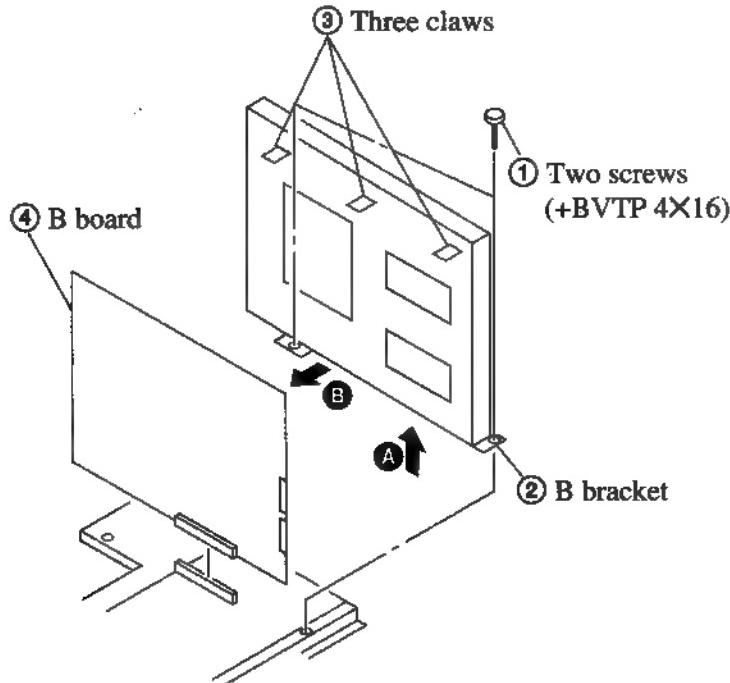
2-1-4. G BOARD REMOVAL



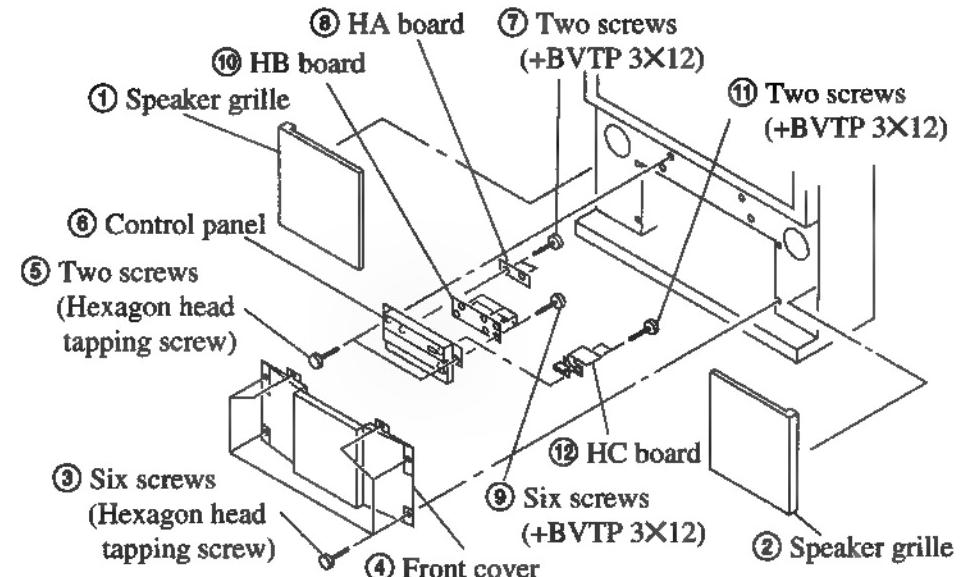
## **2-1-5. U BOARD REMOVAL**



## **2-1-6. B BOARD REMOVAL**

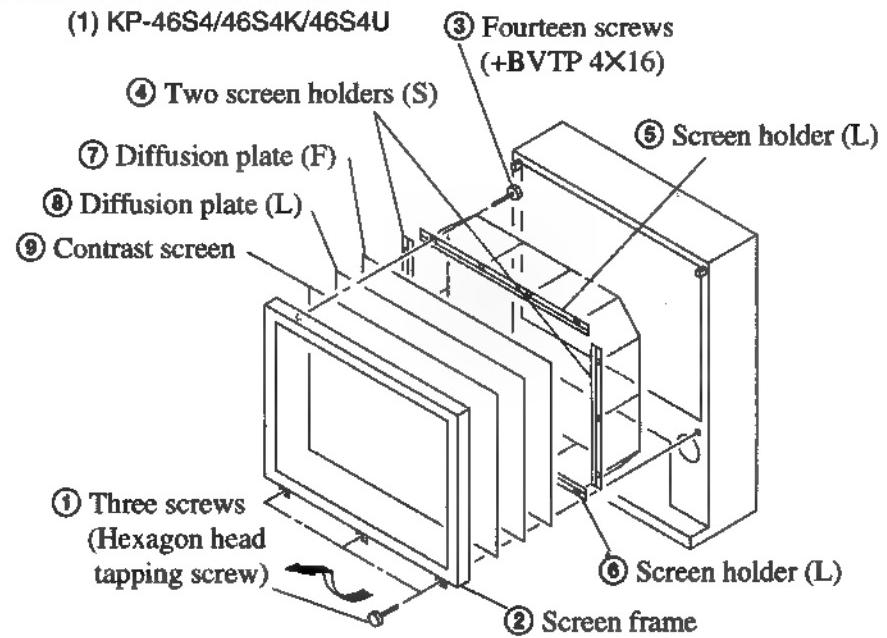


## **2-1-7. HA AND HB BOARDS REMOVAL**

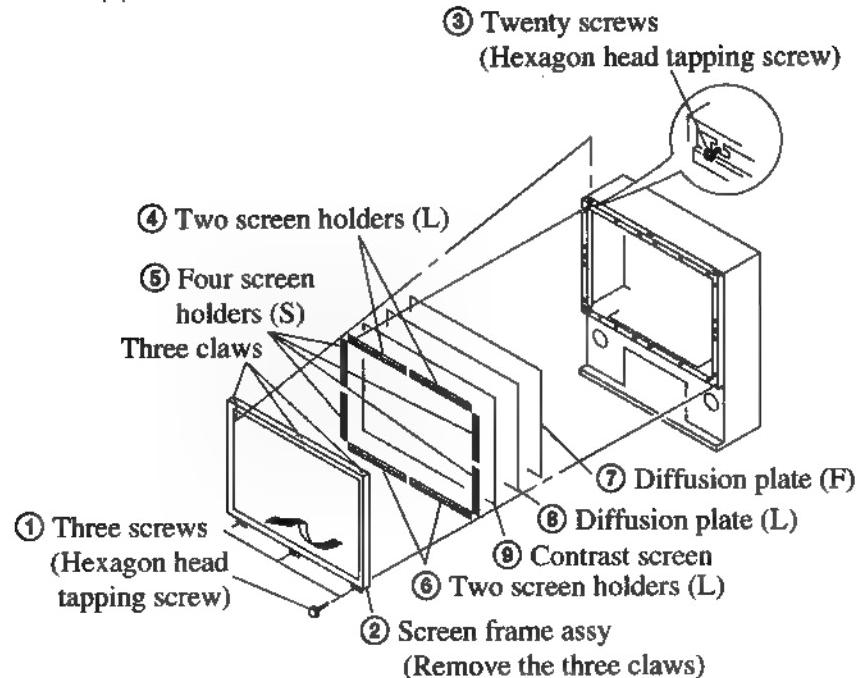


## **2-1-8. BEZNET ASSY REMOVAL**

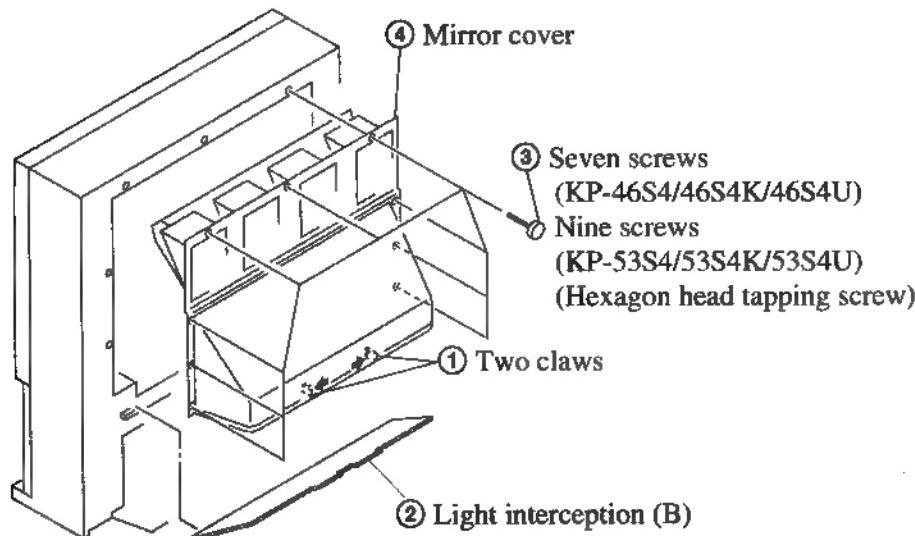
- (1) KP-46S4/46S4K/46S4U



(2) KP-53S4/53S4K/53S4U

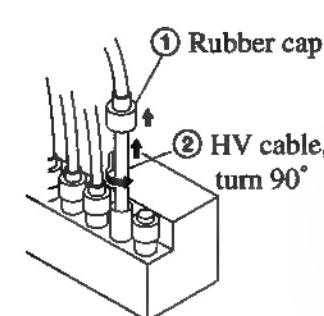


2-1-9. MIRROR COVER ASSY REMOVAL

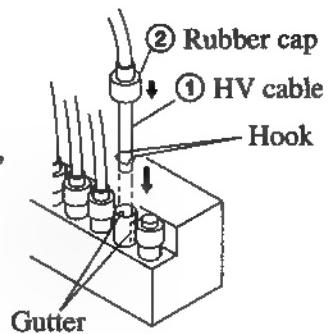


2-1-10. HIGH-VOLTAGE CABLE INSTALLATION AND REMOVAL

(1) Remover



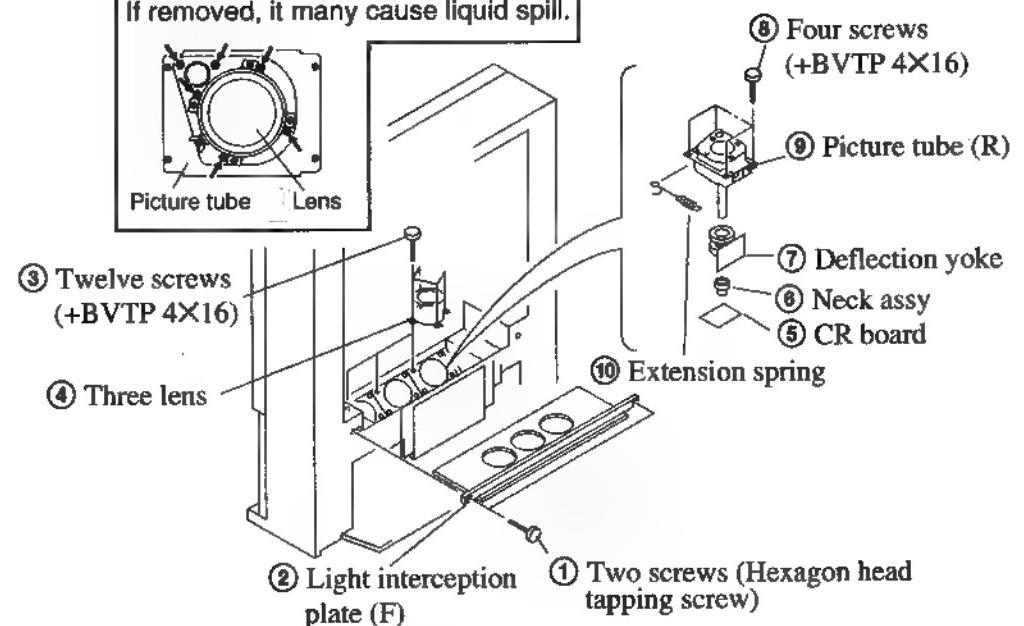
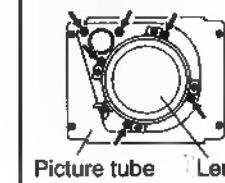
(2) Installation



2-1-11. PICTURE TUBE REMOVAL

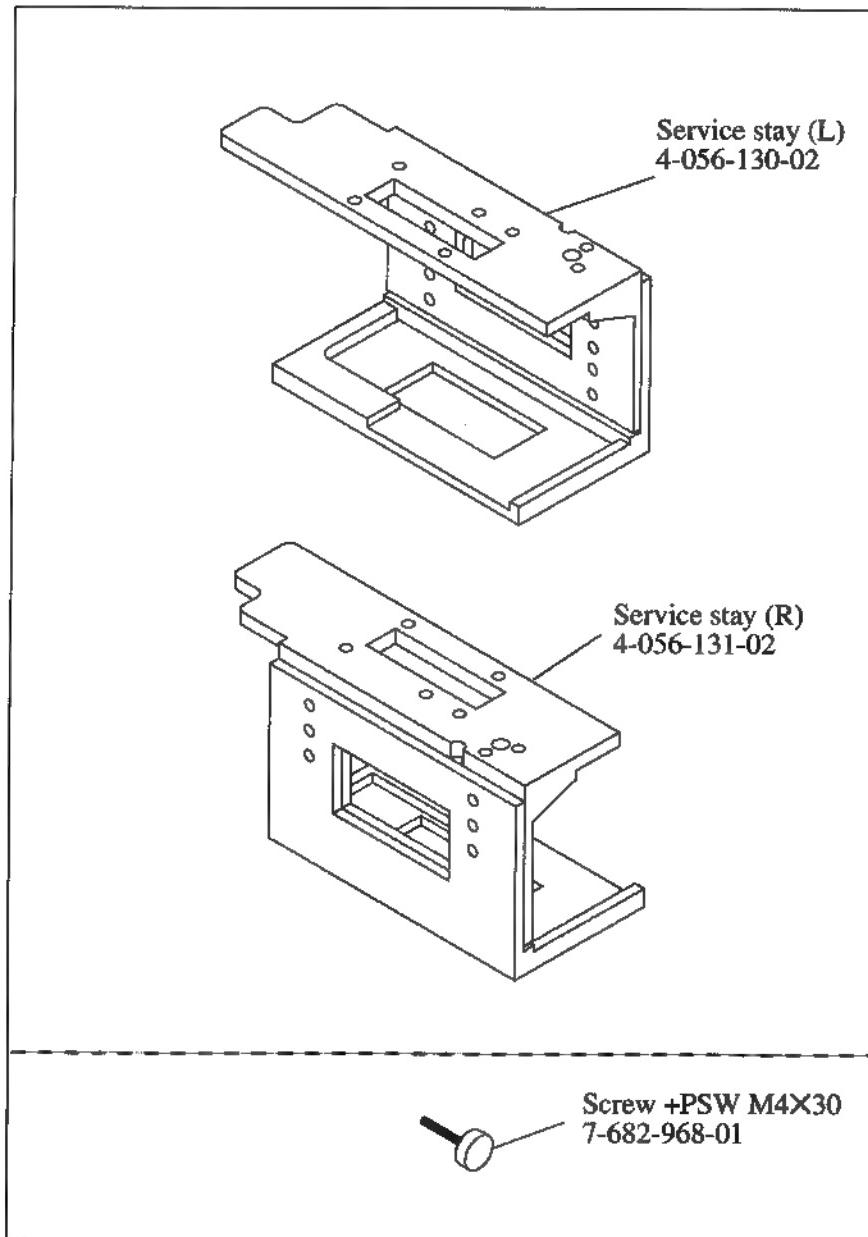
**CAUTION**

Removing the arrow-marked screws is strictly prohibited.  
If removed, it may cause liquid spill.

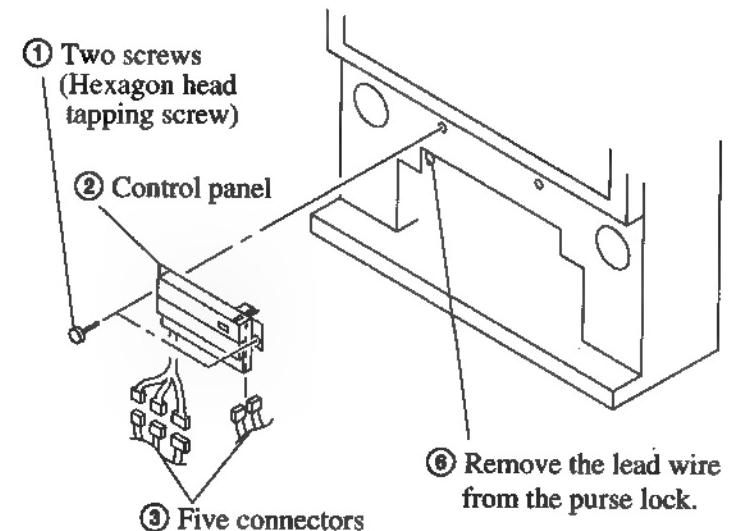


## 2-2.SERVICE STAY ASSY HOW TO USE AND CARRY BACK SERVICE STAY ASSY

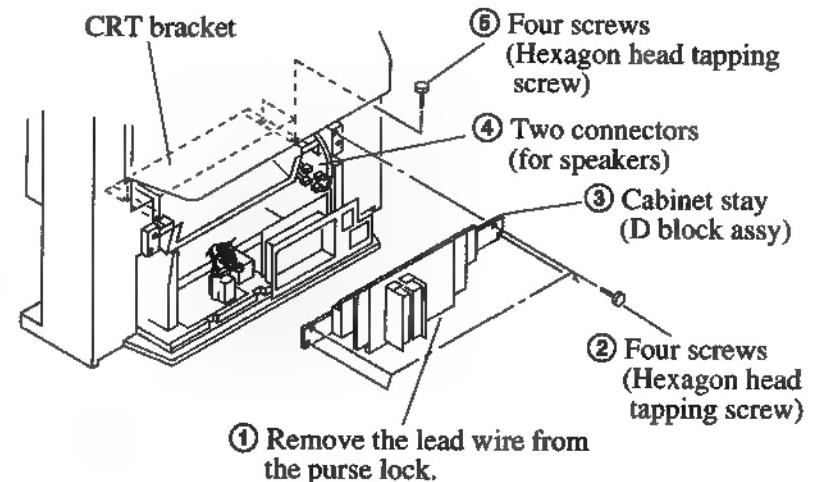
### 2-2-1. SERVICE STAY ASSY (X-4034-033-2)



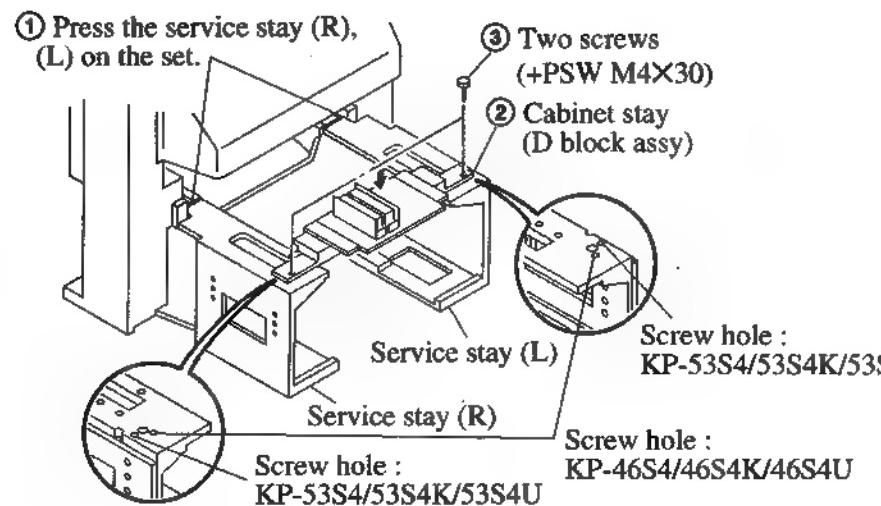
### 2-2-2.CONTROL PANEL REMOVAL



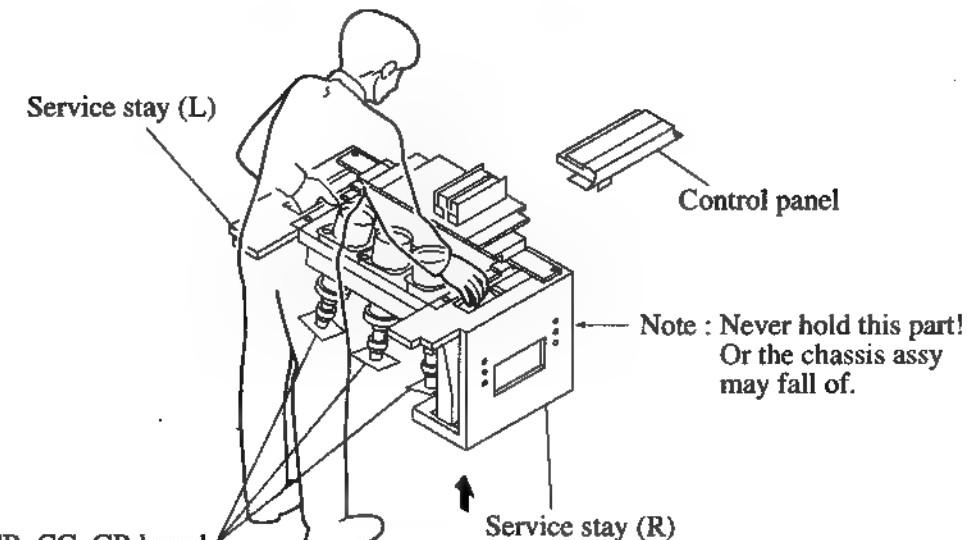
### 2-2-3. CABINET REMOVAL



## 2-2-4. SETTING OF STAY ASSY



## 2-2-6. CARRY BACK SERVICE STAY ASSY

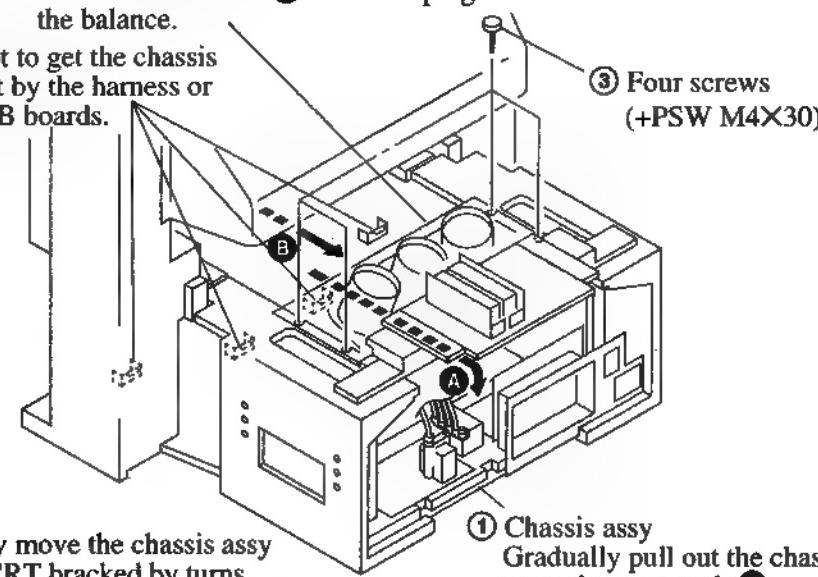


## 2-2-5. INSTALL A CHASSIS ASSY

### ② CRT bracket

Gradually pull out the CRT bracket toward arrow mark **B** while keeping the balance.

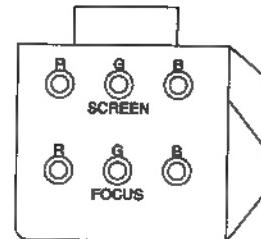
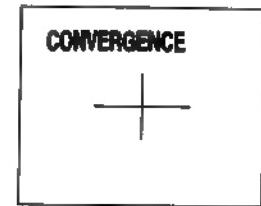
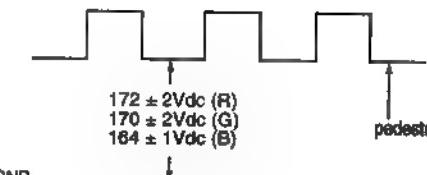
\* Be careful not to get the chassis holder caught by the harness or CR, CG or CB boards.

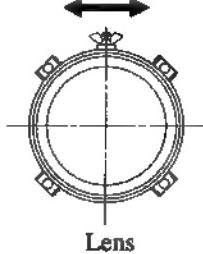
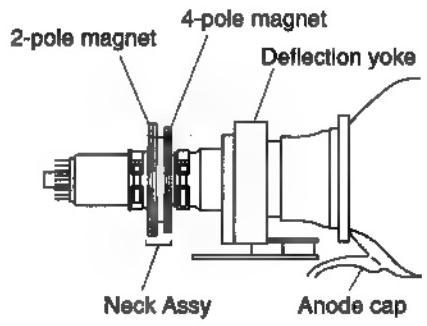


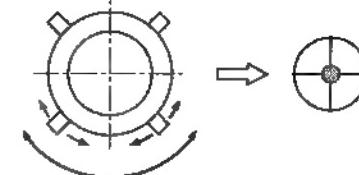
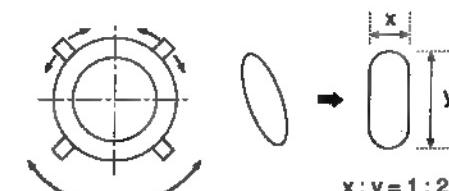
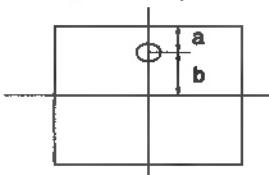
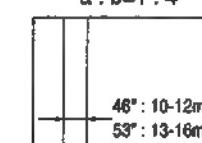
\* Gradually move the chassis assy and the CRT bracket by turns.

### SECTION 3

#### SET-UP ADJUSTMENTS

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
<b>SCREEN VOLTAGE ADJUSTMENT (ROUGH ALIGNMENT)</b> <ol style="list-style-type: none"> <li>Turn the red VR on the FOCUS block all the way to the left and then gradually turn it to the right until the point where you can see the retrace line.</li> <li>Next gradually turn it to the left to the position where the retrace line disappears.</li> </ol>	Monoscope Pattern		<b>PICTURE</b> ..... minimum <b>BRIGHTNESS</b> ..... 50% <b>SCREEN (G2)</b>	 <b>FOCUS block</b>
<b>FOCUS LENS ADJUSTMENT</b> <ol style="list-style-type: none"> <li>Loosen the lens screw.</li> <li>Set in service mode.</li> <li>Use VSP on the service mode menu to show only the green colour.</li> <li>Press the Commander Menu button and select FEATURES and CONVERGENCE to display the test signal on the screen.</li> <li>Rotate the green lens and align with the optimal focus point from the test signal.</li> <li>Use RRH from the service mode menu to set to green and red.</li> <li>Display the test signal and rotate the red lens to obtain the optimum focus at the point where the red and green spots overlap.</li> <li>Use RBH from the service mode menu to set to red and blue.</li> <li>Display the test signal and rotate the blue lens to obtain the optimum focus at the point where the blue and red spots overlap.</li> <li>Tighten the lens screw.</li> </ol>				 <b>CONVERGENCE</b>
<b>SCREEN (G2) ADJUSTMENT</b> <ol style="list-style-type: none"> <li>Select VIDEO mode without signals.</li> <li>Connect an oscilloscope to the TP7103(KR), TP7203(KG) and TP7303(KB) of CR board, CG board and CB board.</li> <li>Adjust R to <math>172 \pm 2\text{Vdc}</math> G to <math>170 \pm 2\text{Vdc}</math> B to <math>164 \pm 1\text{Vdc}</math> by rotating screen VR on the focus block.</li> </ol>				 <p> <math>172 \pm 2\text{Vdc}</math> (R)  <math>170 \pm 2\text{Vdc}</math> (G)  <math>164 \pm 1\text{Vdc}</math> (B) </p> <p>GND</p> <p>pedestal</p>

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
<b>FOCUS VR ADJUSTMENT</b>  1. Set in service mode. 2. Use VSP on the service mode menu to show only the green colour. 3. Press the Commander Menu button (convergence) and output the test signal. 4. Rotate the green VR on the FOCUS block and align to obtain the optimal focus point. 5. Use RRH from the service mode menu to set to green and red. 6. Display the test signal and rotate the red VR to obtain the optimum focus at the point where the red and green spots overlap. 7. Use RBH from the service mode menu to set to red and blue. 8. Display the test signal and rotate the blue VR aligning to obtain the optimum focus at the point where the blue and green spots overlap.				 <b>Lens</b> Scanning line visible.
<b>DEFLECTION YOKE TILT ADJUSTMENT</b>  1. Set in service mode. 2. Set to receive the monoscope signal. 3. Use VSP on the service mode menu to show only the green colour. 4. Loosen the deflection yoke set screw and align the tilt of the deflection yoke so that the bars at the centre of the monoscope pattern are horizontal. 5. After aligning the deflection yoke, fasten it securely to the funnel-shaped portion (neck) of the CRT. 6. The tilt of the deflection yoke for red is aligned with RRH on the service mode menu, and the tilt on the deflection yoke for blue is aligned with RBH on the service menu, is aligned the same as was done for green.	Monoscope pattern			 2-pole magnet 4-pole magnet Deflection yoke Neck Assy Anode cap

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
<b>2-POLE MAGNET ADJUSTMENT</b>  1. Set in service mode. 2. Set to receive the dot pattern signal. 3. Place the caps on the red and blue lens so that only the green colour is showing. 4. Turn the green VR on the focus block to the right and set to overfocus to enlarge the spot. 5. Now align the 2-Pole Magnet so that the enlarged spot is in the center of the Just Focus spot. 6. Align the green focus VR and set for just (precise) focus. 7. Perform the same alignment for red and blue.	Dot pattern		2-pole magnet	Use the center dot 
<b>4-POLE MAGNET ADJUSTMENT</b>  1. Set in service mode. 2. Set to receive the dot pattern signal. 3. Place the caps on the red and blue lens so that only the green colour is showing. 4. Turn the green VR on the focus block to the left and set to underfocus to enlarge the spot. 5. Now align the 4-Pole Magnet so that the enlarged spot becomes a perfect circle.	Dot pattern		4-pole magnet	Use the center dot  $x:y = 1:2$
<b>DEFOCUS ADJUSTMENT</b>  1. Receive the crosshatch signal. 2. Adjust the FOCUS knob so that the crosshatch pattern vertical line width is as in the figure on the right. 3. Blue only defocus Adjustment.	Crosshatch pattern		FOCUS VR • RED • GREEN • BLUE	<ul style="list-style-type: none"> <li>• Focus adjustment point </li> <li><math>a:b=1:4</math></li> <li></li> <li>without flare</li> </ul>

## ELECTRICAL ADJUSTMENT BY REMOTE COMMANDER

By using Remote Commander (RM-831), all circuit adjustments can be made.

### NOTE : Test Equipment Required.

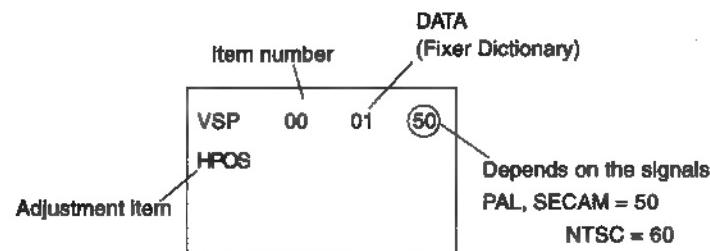
1. Pattern Generator
2. Frequency counter
3. Digital multimeter
4. Audio oscillator

### 1. METHOD OF SETTING THE SERVICE ADJUSTMENT MODE

#### SERVICE MODE PROCEDURE

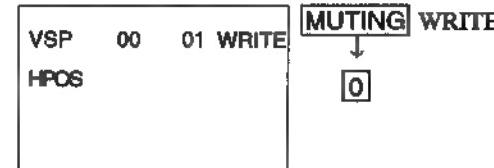
1. Standby mode. (Power off)
2. **DISPLAY** → **5** → **VOL (+)** → **TV POWER** on the Remote Commander.  
( **[ ]** → **5** → **△** → **[ ]** ) (Press each button within a second.)

#### SERVICE MODE ADJUSTMENT



3. The CRT displays the item being adjusted.
4. Press **1** or **4** on the Remote Commander to select the item.
5. Press **3** or **6** on the Remote Commander to change the data.
6. If you want to recover the latest values press **7** then **0** to read the memory.
7. Press **MUTING** then **0** to write into memory.

#### SERVICE ADJUSTMENT MODE MEMORY



8. Press **8** then **0** on the Remote Commander to initialize.
9. Turn set off and on to exit.

### 2. AFTER IC401 (NON VOLATILE MEMORY) REPLACEMENT

1. Enter to Service Mode.
2. Press **5** and **0** of the commander to initialize data.
3. Adjust standard data to call each item number with **3** and **6** of the commander. Write the data per each item number ( **MUTING** + **0** )
4. Select CP2 items menu and respectively set the data with **3** and **6** of the commander.

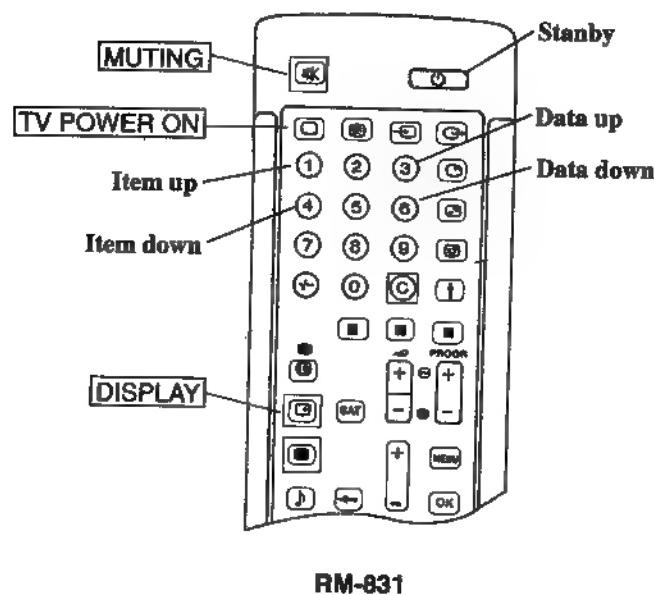
	Item number	Adjustment item	AEP	UK	■ (OIRT)
CP2	03	B/G	1	1	1
	04	I	1	1	1
	05	IRE	0	1	0
	06	D/K	1	0	1
	07	AUS	0	0	0
	08	L	1	1	1

- Press **MUTING** + **0** of the commander to write the data.
5. Select item CSET of TXT menu and set the data with **3** and **6** of the commander.



- Press **MUTING** + **0** of the commander to write the data.
6. Press **8** and **0** of the commander to make the user control data standard.

### 3. ADJUST BUTTONS AND INDICATOR



### 4. SERVICE MODE LIST

#### VSP

	Item number	Adjustment item	Data range	Initial data	Note	Device
VSP	00	HPOS	0~63	51	H-SHIFT	CXD2018Q
	01	VSIZ	0~63	24	V-SIZE	
	02	VPOS	0~63	24	V-SHIFT	
	03	VSCO	0~15	8	S-CORRECTION	
	04	VLIN	0~15	10	V-LINEARITY	
	05	HSIZ	0~63	III	H-SIZE	
	06	HIPN	0~63	38	PIN-AMP	
	07	HKEY	0~31	9	TIILT	
	08	UPCP	0~15	7	UPPER CORNER PIN	
	09	LOCP	0~15	10	LOWER CORNER PIN	
III	10	HBOW	0~15	7	V-BOW	
	11	HSKE	0~15	9	V-ANGLE	

DP

	Item number	Adjustment item	Data range	Initial data	Note	Device
R GH	00	CENT	-127~-+128	20	GREEN. H CENTER	CXP85112B-613S
	01	SKEW	-127~-+128	0	GREEN. H SKEW	
	02	BOW	-127~-+128	0	GREEN. H BOW	
	03	4BOW	-127~-+128	0	GREEN. H 4th BOW	
	04	SIZE	-127~-+128	0	GREEN. H SIZE	
	05	LIN	-127~-+128	7	GREEN. H LINEARITY	
	06	MSIZ	-127~-+128	-5	GREEN. H MIDDLE SIZE	
	07	MLIN	-127~-+128	-1	GREEN. H MIDDLE LINEARITY	
	08	KEY	-127~-+128	0	GREEN. H KEY	
	09	SSKW	-127~-+128	0	GREEN. H SUB SKEW	
	10	MPIN	-127~-+128	30	GREEN. H MIDDLE PIN	
	11	PIN	-127~-+128	0	GREEN. H PIN	
	12	SBOW	-127~-+128	0	GREEN. H SUB BOW	
	13	MBOW	-127~-+128	0	GREEN. H MIDDLE BOW	
	14	4PIN	-127~-+128	-3	GREEN. H 4th PIN	
	15	4SBOW	-127~-+128	0	GREEN. H 4th SUB BOW	
R GV	00	CENT	-127~-+128	0	GREEN. V CENTER	CXP85112B-613S
	01	SKEW	-127~-+128	0	GREEN. V SKEW	
	02	BOW	-127~-+128	2	GREEN. V BOW	
	03	SIZE	-127~-+128	0	GREEN. V SIZE	
	04	LIN	-127~-+128	4	GREEN. V LINEARITY	
	05	MSIZ	-127~-+128	0	GREEN. V MIDDLE SIZE	
	06	MKEY	-127~-+128	0	GREEN. V MIDDLE KEY	
	07	KEY	-127~-+128	10	GREEN. V KEY	
	08	SSKW	-127~-+128	0	GREEN. V SUB SKEW	
	09	MPIN	-127~-+128	25	GREEN. V MIDDLE PIN	
	10	PIN	-127~-+128	-20	GREEN. V PIN	
	11	SBOW	-127~-+128	-2	GREEN. V SUB BOW	
	12	WAVE	-127~-+128	0	GREEN. V WAVE	
	13	4PIN	-127~-+128	10	GREEN. V 4th PIN	
R RH	00	CENT	-127~-+128	-30	RED. H CENTER	CXP85112B-613S
	01	SKEW	-127~-+128	0	RED. H SKEW	
	02	BOW	-127~-+128	0	RED. H BOW	
	03	4BOW	-127~-+128	0	RED. H 4th BOW	
	04	SIZE	-127~-+128	0	RED. H SIZE	
	05	LIN	-127~-+128	-10	RED. H LINEARITY	
	06	MSIZ	-127~-+128	-5	RED. H MIDDLE SIZE	
	07	MLIN	-127~-+128	-5	RED. H MIDDLE LINEARITY	
	08	KEY	-127~-+128	-5	RED. H KEY	
	09	SSKW	-127~-+128	0	RED. H SUB SKEW	
	10	MPIN	-127~-+128	30	RED. H MIDDLE PIN	
	11	PIN	-127~-+128	III	RED. H PIN	

	Item number	Adjustment item	Data range	Initial data	Note	Device
RRH	12	SBOW	-127 ~ +128	30	RED. H SUB BOW	CXP85112B-613S
	13	MBOW	-127 ~ +128	3	RED. H MIDDLE BOW	
	14	4PIN	-127 ~ +128	-3	RED. H 4th PIN	
	15	4SBOW	-127 ~ +128	-2	RED. H 4th SUB BOW	
RRV	00	CENT	-127 ~ +128	■■■	RED. V CENTER	CXP85112B-613S
	01	SKEW	-127 ~ +128	0	RED. V SKEW	
	02	BOW	-127 ~ +128	2	RED. V BOW	
	03	SIZE	-127 ~ +128	0	RED. V SIZE	
	04	LIN	-127 ~ +128	■■■	RED. V LINEARITY	
	05	MSIZ	-127 ~ +128	0	RED. V MIDDLE SIZE	
	06	MKEY	-127 ~ +128	10	RED. V MIDDLE KEY	
	07	KEY	-127 ~ +128	10	RED. V KEY	
	08	SSKW	-127 ~ +128	0	RED. V SUB SKEW	
	09	MPIN	-127 ~ +128	25	RED. V MIDDLE PIN	
	10	PIN	-127 ~ +128	5	RED. V PIN	
	11	SBOW	-127 ~ +128	-2	RED. V SUB BOW	
	12	WAVE	-127 ~ +128	15	RED. V WAVE	
	13	4PIN	-127 ~ +128	10	RED. V 4th PIN	
RBH	00	BSEL	0/1	0	REGISTRATION µ CON BSEL	CXP85112B-613S
	01	CENT	-127 ~ +128	30	BLUE. H CENTER	
	02	SKEW	-127 ~ +128	0	BLUE. H SKEW	
	03	BOW	-127 ~ +128	0	BLUE. H BOW	
	04	4BOW	-127 ~ +128	■■	BLUE. H 4th BOW	
	05	SIZE	-127 ~ +128	-1	BLUE. H SIZE	
	06	LIN	-127 ~ +128	-10	BLUE. H LINEARITY	
	07	MSIZ	-127 ~ +128	-5	BLUE. H MIDDLE SIZE	
	08	MLIN	-127 ~ +128	5	BLUE. H MIDDLE LINEARITY	
	09	KEY	-127 ~ +128	0	BLUE. H KEY	
	10	SSKW	-127 ~ +128	0	BLUE. H SUB SKEW	
	11	MPIN	-127 ~ +128	30	BLUE. H MIDDLE PIN	
	12	PIN	-127 ~ +128	0	BLUE. H PIN	
	13	SBOW	-127 ~ +128	-30	BLUE. H SUB BOW	
	14	MBOW	-127 ~ +128	-3	BLUE. H MIDDLE BOW	
	15	4PIN	-127 ~ +128	-3	BLUE. H 4th PIN	
	16	4SBOW	-127 ~ +128	2	BLUE. H 4th SUB BOW	
RBV	00	CENT	-127 ~ +128	0	BLUE. V CENTER	CXP85112B-613S
	01	SKEW	-127 ~ +128	0	BLUE. V SKEW	
	02	BOW	-127 ~ +128	2	BLUE. V BOW	
	03	SIZE	-127 ~ +128	-10	BLUE. V SIZE	
	04	LIN	-127 ~ +128	0	BLUE. V LINEARITY	
	05	MSIZ	-127 ~ +128	0	BLUE. V MIDDLE SIZE	
	06	MKEY	-127 ~ +128	-10	BLUE. V MIDDLE KEY	

	Item number	Adjustment item	Data range	Initial data	Note	Device
R BV	07	KEY	-127 ~ +128	0	BLUE. V KEY	CXP85112B-613S
	08	SSKW	-127 ~ +128	0	BLUE. V SUB SKEW	
	09	MPIN	-127 ~ +128	25	BLUE. V MIDDLE PIN	
	10	PIN	-127 ~ +128	0	BLUE. V PIN	
	11	SBOW	-127 ~ +128	■■■	BLUE. V SUB BOW	
	12	WAVE	-127 ~ +128	-15	BLUE. V 3th WAVE	
	13	4PIN	-127 ~ +128	10	BLUE. V 4th PIN	

**D/A**

	Item number	Adjustment item	Data range	Initial data	Note	Device
D/A	00	BKU	0 ~ 63	63	VBLK UP-SIDE	CXA1315PM
	01	BKD	0 ~ 63	0	VBLK DOWN-SIDE	

**MCD**

	Item number	Adjustment item	Data range	Initial data	Note	Device
MCD	00	MHUE	0 ~ 31	■■■	SUB HUE OF MAIN PICTURE	TDA9141
	01	YDLT	0 ~ 15	7	Y DELAY	

**SCD**

	Item number	Adjustment item	Data range	Initial data	Note	Device
SCD	00	SHUE	0 ~ 31	15	SUB HUE OF SUB PICTURE	TDA9160

**RGB**

	Item number	Adjustment item	Data range	Initial data	Note	Device
RGB	00	SCOL	0 ~ 15	4	SUB COLOUR	TDA4780
	01	SBRT	0 ~ 63	27	SUB BRIGHT	
	02	RAMP	0 ~ 63	31	RED GAIN	
	03	GAMP	0 ~ 63	31	GREEN GAIN	
	04	BAMP	0 ~ 63	31	BLUE GAIN	
	05	RCUT	0 ~ 63	31	RED LEVEL REFERENCE	
	06	GCUT	0 ~ 63	31	GREEN LEVEL REFERENCE	
	07	BCUT	0 ~ 63	31	BLUE LEVEL REFERENCE	
	08	PDL	0 ~ 63	31	PEAK DRIVE LIMITER	
	09	GNMA	0 ~ 63	0	GAMMA	
	10	ADBL	0/1	0	ADAPTIVE BLACK	
	11	RELC	0/1	1	RELATIVE TO CUT-OFF	
	12	TCPL	0/1	1	TIME CONSTANT PEAK DRIVE LIMITER	

**PIP**

	Item number	Adjustment item	Data range	Initial data	Note	Device
PIP	00	RDV	0~15	8	V READ DELAY	SDA9188-3X
	01	RDH	0~63	16	H READ DELAY	
	02	FRY	0~15	3	BRIGHTNESS OF THE BORDER FRAME	
	03	9V50	0~7	3	MULTI PIP V 50Hz	
	04	9H50	0~7	2	MULTI PIP H 50Hz	
	05	9V60	0~7	2	MULTI PIP V 60Hz	
	06	9H60	0~7	3	MULTI PIP H 60Hz	
	07	SCON	0~15	8	CONTRAST D/A CONVERTER	

**IPQ**

	Item number	Adjustment item	Data range	Initial data	Note	Device
IPQ	00	CTN	0/1	0	CINE MODE (ABAB RASTER) OFF/ON	83C652
	01	107	0/1	1	MEMORY CONFIGURATION	
	02	LFR	0/1	1	TMS4C2972 SWITCH	
	03	HWE	0~15	15	LINE FLICKER REDUCTION MODE OFF/ON	
	04	NR	0~3	2	NOISE REDUCTION LEVEL	
	05	Y-V	0~255	60	Y-VALUE (BRIGHTNESS)	
	06	UV-V	0~255	0	UV-VALUE (COLOUR)	
	07	PEAK	0~127	III	PEAKING	
	08	CTI	0~127	64	CTI LEVEL DATA	
	09	VWE	0~63	31	VWE1 DELAY	

**TXT**

	Item number	Adjustment item	Data range	Initial data	Note	Device
TXT	00	TXH	0~255	9	H START POSITION	TPU3040/TPU3041
	01	TXV	0~63	44	V START POSITION	
	02	VSP	0~255	59	V STOP POSITION	
	03	BSP	0~255	61	BLANKING STOP	
	04	BST	0~255	53	BLANKING START	
	05	QSF	0~31	1	ACQUISITION SOFT SLICER	
	06	A7P	0~255	10	VALUE OF ADDRESS 007FH	
	07	QDT	0~63	13	ACQUISITION DATA SLICER	
	08	CST	0~255	0	CLAMPING START	
	09	CSP	0~255	80	CLAMPING STOP	
	10	LMT	0/1	0	LIMIT SLICER ADAPTION SW	
	11	GMX	0~255	31	GAIN MAX	
	12	FMX	0~255	31	FILTER MAX	
	13	TVER	0~3	3	TPU VERSION (TC2023)	
	14	CSET	0~7	3	TELETEXT LANGUAGE SETTING 3: WEST (AEP/UK) 5: EAST (K), 6: GREEK	

**AP**

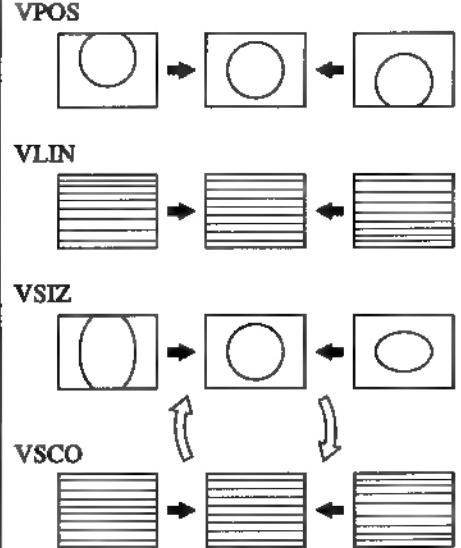
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AP	00	FAW	0~255	III	NICAM FAW THRESHOLD	MSP3410
	01	CTM	0~255	4	NICAM ERROR BIT THRESHOLD(MONO → NICAM)	
	02	CTN	0~255	80	NICAM ERROR BIT THRESHOLD(NICAM → MONO)	
	03	WGO	0~255	10	WEST GERMAN STEREO LOW THRESHOLD	
	04	WGS	0~255	21	WEST GERMAN STEREO HIGH THRESHOLD	
	05	WGT	0~255	80	WEST GERMAN STEREO LOW 2 THRESHOLD	
	06	WGB	0~255	250	WEST GERMAN STEREO HIGH 2 THRESHOLD	
	07	ACG	0/1	1	AGC AUTO / CONSTANT SWITCH	
	08	CDB	0~63	30	AGC GAIN VALUE AT CONSTANT MODE	
	09	FMP	0~127	26	FM MONO PRESCALE	
	10	WGP	0~127	26	WEST GERMAN STEREO PRESCALE	
	11	INIP	0~127	127	I NICAM PRESCALE	
	12	BNIP	0~127	72	BIG NICAM PRESCALE	
	13	LNIP	0~127	II	L NICAM PRESCALE	
	14	DNIP	0~127	72	D/K NICAM PRESCALE	
	15	CRM	0/1	0	CARRIER MUTE FUNCTION	
	16	ACO	0/1	1	AUDIO CLOCK OUT OFF/ON	
	17	WAC	0~15	1	WEST GERMAN STEREO JUDGE CONSTANT	

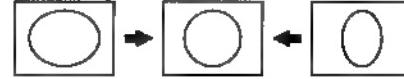
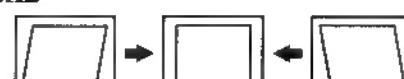
**CPU**

	Item number	Adjustment item	Data range	Initial data	Note	Device
CPU	00	OSH	0~63	18	QSD H POSITION	CXP85460
	01	ODL	0~256	15	POWER ON DELAY	
	02	FTZP	0/1	1	FTZ MUTE PRIORITY	
	03	RGBP	0/1	0	RGB MODE PRIORITY	
	04	NICP	0/1	1	NICAM PRIORITY	
	05	B/G	0/1	1	TV SYSTEM B/G OFF/ON	
	06	I	0/1	1	TV SYSTEM I OFF/ON	
	07	IRE	0/1	0	TV SYSTEM IRE OFF/ON	
	08	D/K	0/1	1	TV SYSTEM D/K OFF/ON	
	09	AUS	0/1	0	TV SYSTEM AUS OFF/ON	
	10	L	0/1	1	TV SYSTEM L OFF/ON	
	11	MYC2	0/1	0	YC2/AV2 PRIORITY	
	12	MYC4	0/1	0	YC4/AV4 PRIORITY	

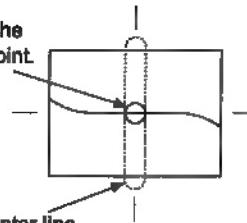
**IP 2**

	Item number	Adjustment item	Data range	Initial data	Note	Device
IP2	00	BOX	0/1	0	BOX FUNCTION SWITCH	TDA9160
	01	SCF	0~3	0	SCREEN FADE FUNCTION	
	02	SPS	0~3	0	SPLIT SCREEN FUNCTION	
	03	PHAS	0/1	0	PHASE FLAG	
	04	AXIS	0/1	1	RGB AXIS	
	05	HSFT	0~31	10	H SHIFT ADJUSTMENT	
	06	SPTE	0/1	1	PICTURE SHIFT ENABLE	
	07	SPTF	0/1	0	PICTURE SHIFT FACTORY CHECK	
	08	3BCN	0~255	10	BINARY BIT CHECK FOR TELETEXT	

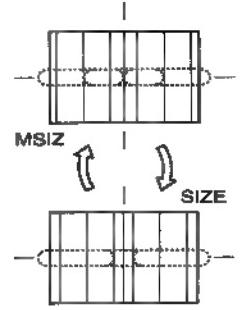
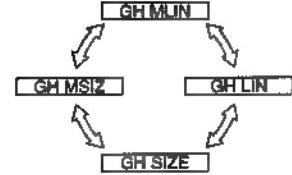
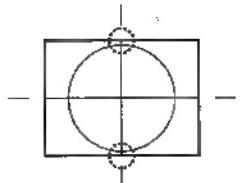
ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
<b>CONVERGENCE ADJUSTMENT</b> <ul style="list-style-type: none"> <li>● When replacing the deflection yoke, always perform "DEFLECTION YOKE TILT ADJUSTMENT" before adjusting the convergence.</li> </ul> <p>Adjustment procedure</p> <pre>     graph TD       A[VSP MAIN] --&gt; B[R GH(SUB), R GV(SUB)]       B --&gt; C[R RH(SUB), R RV(SUB)]       C --&gt; D[R BH(SUB), R BV(SUB)]   </pre>				
<b>• GREEN REGISTRATION ADJUSTMENT</b> <ul style="list-style-type: none"> <li>• V-SHIFT adjustment</li> <li>• V-LINEARITY adjustment</li> <li>• V-SIZE, V-CORRECTION adjustment           <p>While tracking, adjust so that the lattice intervals for VSIZ and VSCO are equal.</p> </li> </ul>	Monoscope pattern or Crosshatch pattern		<VSP MENU> VSP VPOS VSP VLIN VSP VSIZ VSP VSCO	

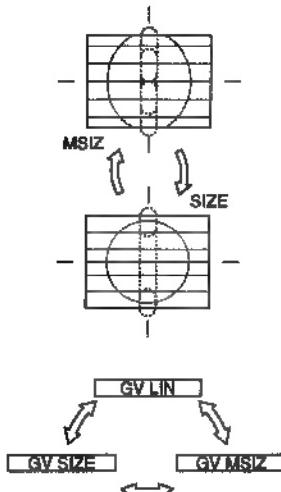
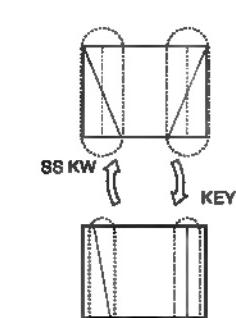
ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
<ul style="list-style-type: none"> <li>• H-SHIFT adjustment</li> </ul>			VSP HPOS	HPOS 
<ul style="list-style-type: none"> <li>• H-SIZE adjustment Finely adjust with SUB MSIZ.</li> </ul>			VSP HSIZ	HSIZ 
<ul style="list-style-type: none"> <li>• PIN-AMP adjustment Finely adjust with SUB MPIN.</li> </ul>			VSP HPIN	HPIN 
<ul style="list-style-type: none"> <li>• UPPER/LOWER-CORNER PIN adjustment Correct the screens top and bottom bow line. However, if this adjustment is overdone, distortion may occur with the PIN-AMP adjustment that can not be re-adjusted.</li> </ul> <p>Note : The PIN-AMP adjusts the overall screen from top to bottom, but the UPPER/LOWER-CORNER PIN adjustments have large movement in the top and bottom sections, so be careful.</p>			VSP UPCP VSP LOCP	UPCP  LOCP 
<ul style="list-style-type: none"> <li>• V-ANGLE, V-BOW adjustment Correct the tilt and bow of the vertical line at the center of the screen.</li> </ul>			VSP HSKE VSP HBOW	HSKE  HBOW 
<ul style="list-style-type: none"> <li>• TILT adjustment Adjust to eliminate the tilt of one of the two vertical lines at both ends of the screen.</li> </ul>			VSP HKEY	HKEY 

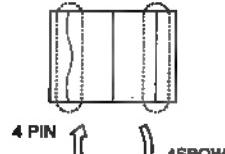
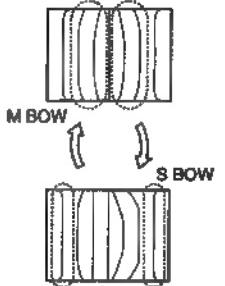
ADJUSTMENT ITEM AND PROCEDURE						EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
<b>CONVERGENCE SUB ADJUSTMENT</b>									
Adjustment	O : Yes	- : No							
Display	Adjustment item	Adjustment type							
		RGH	RGV	RRH	RRV	RBH	RBV		
BSEL	COL SELECT	-	-	-	-	O	-		
CENT	CENT	O	O	O	O	O	O		
SKEW	SKEW	O	O	O	O	O	O		
BOW	BOW	O	O	O	O	O	O		
4BOW	4TH BOW	O	-	O	-	O	-		
SIZE	SIZE	O	O	O	O	O	O		
LIN	LIN	O	O	O	O	O	O		
MSIZ	MID SIZE	O	O	O	O	O	O		
MLIN	MID LIN	O	O	O	-	O	-		
MKEY	MID KEY	-	O	-	O	-	O		
KEY	KEY	O	O	O	O	O	O		
SSKW	SUB SKEW	O	O	O	O	O	O		
M PIN	MID PIN	O	O	O	O	O	O		
PIN	PIN	O	O	O	O	O	O		
SBOW	SUB BOW	O	O	O	O	O	O		
WAVE	WAVE	-	O	-	O	-	O		
MBOW	MID BOW	O	-	O	-	O	-		
4PIN	4TH PIN	O	O	O	O	O	O		
4SBOW	4TH SUB BOW	O	-	O	-	O	-		

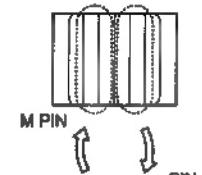
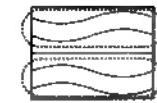
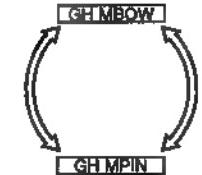
ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
<p><b>• GREEN SUB ADJUSTMENT</b></p> <p><b>SCREEN CENTER SECTION GREEN VERTICAL LINE ADJUSTMENT</b></p> <p>1. Finely adjust with RGH CENT, RGH BOW, RGH SKEW. Adjust by watching out for the RGH CENT screen center section.</p> <p>2. RGH 4TH BOW adjustment Correct the corner distortion that could not be adjusted away with the RGH 4BOW adjustment.</p>			<p>&lt;RGH MENU&gt; RGH CENT RGH BOW RGH SKEW</p> <p>RGH 4BOW</p>	<p>Watch out only for the GH CENT center point.</p>  <p>Watch the vertical center line.</p> <p>RGH CENT</p>  <p>RGH BOW</p>  <p>RGH SKEW</p>  <p>RGH 4BOW</p> 

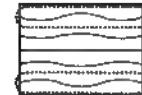
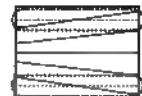
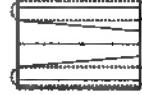
ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
<b>SCREEN CENTER SECTION GREEN HORIZONTAL LINE ADJUSTMENT</b> <ol style="list-style-type: none"> <li>1. Finely adjust the center position of the vertical line at the center of the screen with RGV CENT.</li>   <li>2. Correct the tilt and bow of the horizontal line at the center of the screen with RGV SKEW and RGV BOW.</li> </ol>			<RGV MENU>  RGV CENT  RGV SKEW RGV BOW	   
<b>GREEN SIZE AND LINEARITY ADJUSTMENT</b> <ol style="list-style-type: none"> <li>1. Balance the sizes at both sides of the center section of the screen with RGH MLIN.</li> <li>2. Balance the sizes on both end sections of the screen with RGH LIN.</li> <li>3. While tracking, adjust with RGH MLIN and RGH LIN so that the sizes of the horizontal line at the center of the screen are symmetrical left and right.</li> </ol>			<RGH MENU>  RGH MLIN RGH LIN	

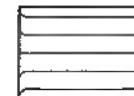
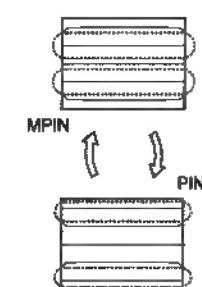
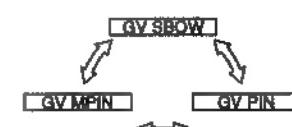
ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
<p><b>GREEN HORIZONTAL SIZE ADJUSTMENT</b></p> <ol style="list-style-type: none"> <li>1. Adjust with RGH MSIZE so that the sizes of both ends and of both sides of the center section of the screen are equal.</li> <li>2. Adjust with RGH SIZE so that the horizontal sizes of both ends and of both sides of the center section of the screen are equal.</li> <li>3. While tracking, adjust with RGH MSIZ and RGH SIZE so that the lattice intervals for the horizontal line section of the center section of the screen are equal and so that the horizontal size is the prescribed value.</li> <li>4. If M LIN is changed when the RGH MSIZ and RGH SIZE adjustment is complete, adjust again while tracking.</li> </ol> <p>●With just the H SIZE adjustment in MAIN, if there is no need to adjust RGH SIZE in SUB this can save power.</p> <p><b>GREEN VERTICAL LINEARITY ADJUSTMENT</b></p> <ol style="list-style-type: none"> <li>1. Adjust RGV LIN so that the vertical lines at the top and bottom of the screen are symmetrical.</li> </ol>			<p>&lt;RGH MENU&gt;</p> <p>RGH MSIZ</p> <p>RGH SIZE</p>	 
			<p>&lt;RGV MENU&gt;</p> <p>RGV LIN</p>	

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
<p><b>GREEN VERTICAL SIZE ADJUSTMENT</b></p> <ol style="list-style-type: none"> <li>1. Adjust with RGV MSIZE so that the sizes for the top and bottom sections of the screen and for both sides of the center section of the screen are equal.</li> <li>2. Set the vertical size to the prescribed value with RGV SIZE.</li> <li>3. Adjust RGV MSIZ and RGV SIZE watching the vertical line at the center section of the screen.</li> <li>4. While tracking, adjust with RGV MSIZ and RGV SIZE so that the lattice intervals for the vertical line section of the center section of the screen are equal and so that the vertical size is the regulation value.</li> <li>5. If RGV LIN is out of place when the RGV MSIZ and RGV SIZE adjustment is complete, adjust again while tracking.</li> </ol> <p>● If there is no need to adjust RGV SIZE in SUB with just the V SIZE adjustment in MAIN, this can save power.</p>			<p>&lt;RGV MENU&gt; RGV MSIZ  RGV SIZE</p>	
<p><b>GREEN HORIZONTAL TRAPEZOIDAL DISTORTION ADJUSTMENT</b></p> <ol style="list-style-type: none"> <li>1. Adjust with RGH SSKW so that the tilt of the vertical lines at both ends of the screen is symmetrical left and right.</li> <li>2. Adjust with RGH KEY so that there is no tilt in the vertical lines at both ends of the screen.</li> <li>3. If there is a tilt on either the left or right after the RGH KEY adjustment, adjust while tracking.</li> </ol>			<p>&lt;RGV MENU&gt; RGH SSKW  RGH KEY</p>	

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
<b>GREEN HORIZONTAL QUATERNARY ADJUSTMENT</b> <ol style="list-style-type: none"> <li>1. Correct the quaternary distortion with RGH 4PIN.</li> <li>2. While balancing, correct the quaternary distortion of both end sections of the screen with RGH 4SBOW.</li> <li>3. While tracking, adjust with RGH 4PIN and RGH 4SBOW.</li> </ol>			<RGH MENU>  RGH 4PIN RGH 4SBOW	
<b>GREEN HORIZONTAL ASYMMETRICAL PIN DISTORTION ADJUSTMENT</b> <ol style="list-style-type: none"> <li>1. Adjust with RGH MBOW so that the pin asymmetry at both sides of the center section of screen is symmetrical.</li> <li>2. Adjust with RGH SBOW so that the bow at both end sections of the screen is symmetrical left and right.</li> <li>3. While tracking, adjust with RGH MBOW and RGH SBOW so that the bow of vertical lines on the entire screen is symmetrical left and right.</li> </ol>			<RGH MENU>  RGH MBOW  RGH SBOW	

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
<b>GREEN HORIZONTAL SYMMETRICAL PIN DISTORTION</b> <b>ADJUSTMENT</b> <ol style="list-style-type: none"> <li>1. Adjust the pin distortion at both sides of the center section of the screen with RGH MPIN.</li> <li>2. Adjust the pin distortion at both end sections of the screen with RGH PIN.</li> <li>3. While tracking, adjust with RGH MPIN and RGH PIN so that the PIN of vertical lines on the entire screen have no bowing.</li> <li>4. If there is asymmetrical pin distortion after the RGH MPIN and RGH PIN adjustments, adjust with RGH MBOW and RGH SBOW while tracking.</li> </ol> <p>●With just the PIN AMP adjustment in MAIN, if there is no need to adjust RGV PIN in SUB, this can save power.</p>			<RGH MENU>  <b>RGH MPIN</b>  <b>RGH PIN</b>  <b>RGH MBOW</b> <b>RGH SBOW</b>	 
<b>GREEN VERTICAL WAVE (TERTIARY DISTORTION)</b> <b>ADJUSTMENT</b> <ol style="list-style-type: none"> <li>1. Take the screen top and bottom horizontal lines with RGV WAVE and find the secondary and quaternary waveform.</li> <li>2. There is KEY distortion after the RGV WAVE adjustment, so adjust with RGV WAVE and RGV KEY while tracking.</li> </ol>			<RGV MENU>  <b>RGV WAVE</b>  <b>RGV KEY</b>	 

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
<b>GREEN VERTICAL QUATERNARY DISTORTION</b> <b>ADJUSTMENT</b> <ol style="list-style-type: none"> <li>Correct the quaternary distortion of the horizontal lines at the top and bottom sections of the screen with RGV 4PIN.</li> <li>Since there is no 4SBOW for vertical correction, there will be a slight imbalance, but adjust to eliminate the distortion from the horizontal line at either the top or the bottom of the screen.</li> <li>In many cases, the horizontal lines at the top and bottom sections of the screen are not straight lines after the adjustment. As long as the secondary distortion is mild enough that it can be corrected with the PIN adjustment, this is OK.</li> </ol>			<b>&lt;RGV MENU&gt;</b>  <b>RGV 4PIN</b>	<b>RGV 4PIN</b> 
<b>GREEN VERTICAL TRAPEZOIDAL DISTORTION</b> <b>ADJUSTMENT</b> <ol style="list-style-type: none"> <li>Adjust with RGV SSKW so that the tilt of the horizontal lines at the top and bottom sections of the screen is symmetrical about the center position horizontal line.</li> <li>Adjust with RGV MKEY so that there is no tilt for the line sections at both sides of the horizontal lines at the center section of the stream.</li> <li>Adjust with RGV KEY so that there is no tilt for the horizontal lines at the top and bottom sections of the screen.</li> <li>While tracking, adjust with RGV MKEY and RGV KEY so that there is no tilt for the horizontal lines on the entire screen.</li> <li>If the tilt is unbalanced after the RGV MKEY and RGV KEY adjustment, adjust again with RGV SSKW.</li> </ol>			<b>&lt;RGV MENU&gt;</b>  <b>RGV SSKW</b>  <b>RGV MKEY</b>  <b>RGV KEY</b>  <b>RGV SSKW</b>	<b>RGV SSKW</b>  <b>MKEY</b> <b>KEY</b>  <b>GV SSKW</b> <b>GV KEY</b> <b>GV MKEY</b> 

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
<b>GREEN VERTICAL ASYMMETRICAL PIN DISTORTION (SECONDARY DISTORTION) ADJUSTMENT</b>			<RGV MENU>  RGV SBOW	RGV SBOW  
<b>GREEN VERTICAL ASYMMETRICAL PIN DISTORTION ADJUSTMENT</b> <ol style="list-style-type: none"> <li>1. Correct the asymmetrical pin distortion at the top and bottom sections of the screen with RGV SBOW.</li> <li>2. Adjust the pin distortion for both side sections and the center of the screen with RGV MPIN.</li> <li>3. Adjust with RGV PIN so that the horizontal lines at the top and bottom sections of the screen are straight lines.</li> <li>4. After the adjustments in Items 1-3, adjust the tracking with RGV SBOW, RGV MPIN, and RGV PIN.</li> </ol>			<RGV MENU>  RGV MPIN  RGV PIN  RGV SBOW	  

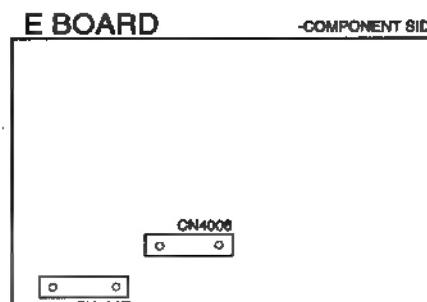
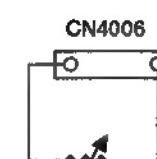
ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
<p><b>GREEN AND RED REGISTRATION ADJUSTMENT (RRH, RRV)</b></p> <p>1. Receive a PAL cross-hatch signal. 2. Adjust so that the red lines lay on the green lines. Adjust with the same procedure as the GREEN SUB adjustment.</p> <p>Notes: 1. The main correction is not carried out during red registration adjustment. 2. Beware. The green adjustment items can be changed by mistake. 3. Unlike for green, adjust within the range -127 ~ +128.</p>	PAL Cross-hatch pattern			
<p><b>GREEN AND BLUE REGISTRATION ADJUSTMENT (RBH, RBV)</b></p> <p>1. Receive a PAL cross-hatch signal. 2. Adjust so that the blue and green lines are on top of each other.</p> <p>Notes : 1. The main correction is not carried out during RED registration adjustment. 2. Beware. The GREEN and RED adjustment items can be changed by mistake.</p>	PAL Cross-hatch pattern			

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
<b>AGC ADJUSTMENT</b> <ol style="list-style-type: none"> <li>1. Receive an off-air signal.</li> <li>2. Adjust the AGC VR ( IF 1001 ) so that there is no snow noise and cross-modulation.</li> </ol>				
<b>WHITE BALANCE ADJUSTMENT</b> <ol style="list-style-type: none"> <li>1. Receive the monoscope pattern signal and adjust the picture quality with the menu.</li> <li>2. Adjust service mode SBRT so that the signal 10 IRE section barely glows.</li> <li>3. Receive the all-white pattern signal.</li> <li>4. Adjust the white balance with service mode GCUT and BCUT.</li> <li>5. Adjust service mode SBRT so that the signal 100 IRE section barely glows.</li> <li>6. Adjust the white balance with service mode GAMP and BAMP.</li> <li>7. Repeatedly adjust the white balance for the minimum and maximum picture settings.</li> </ol>	Monoscope pattern  All White pattern		<p>PICTURE ..... minimum          &lt; RGB MENU &gt;          RGB SBRT</p> <p>RGB GCUT          RGB BCUT</p> <p>PICTURE ..... minimum          RGB GAMP          RGB BAMP</p> <p>PICTURE ..... maximum</p>	

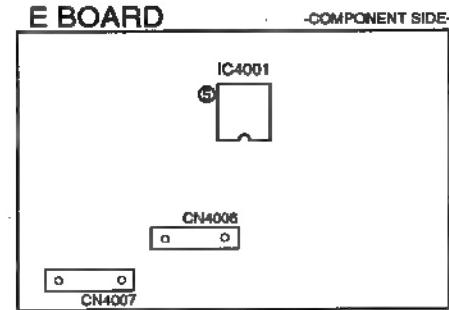
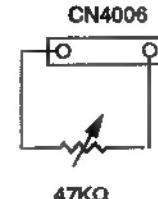
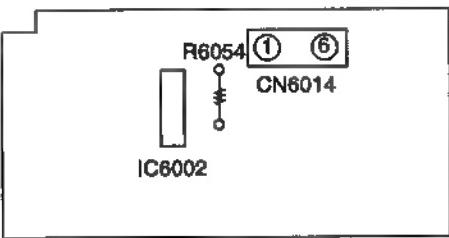
## SECTION 4

### SAFETY RELATED ADJUSTMENTS

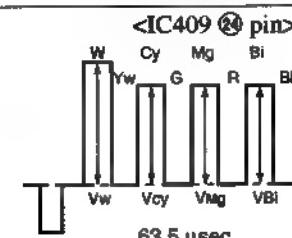
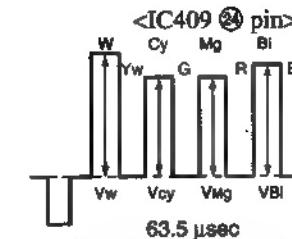
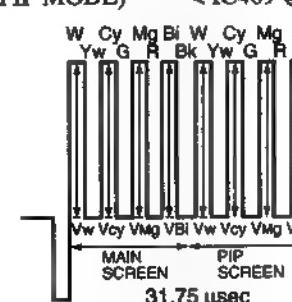
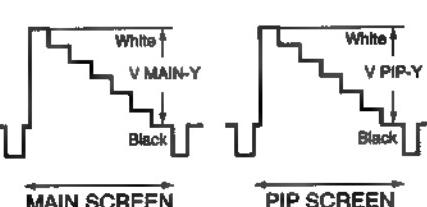
ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
<p><b>[ E BOARD ]</b></p> <p><b>HV HOLD DOWN CIRCUIT OPERATION CHECK AND ADJUSTMENT</b></p> <p>When replacing the following components marked with <input checked="" type="checkbox"/> on the schematic diagram, always check hold-down voltage and if necessary re-adjust.</p> <p><b>OPERATION CHECK</b></p> <ol style="list-style-type: none"> <li>1. Connect a HV static voltmeter to the unconnected plug of the high-voltage block.</li> <li>2. Connect a <math>68\text{k}\Omega</math> variable resistor, set to maximum value, across CN4006.</li> <li>3. Power on the set.</li> <li>4. Receive dot signal pattern.</li> <li>5. Gradually lower the value of the variable resistor and check that the hold-down circuit operates at a static voltmeter reading of <math>33.40 \pm 0.30\text{kVdc}</math> when the raster disappears.</li> </ol> <p><b>HV HOLD-DOWN ADJUSTMENT</b></p> <ol style="list-style-type: none"> <li>1. REPART STEPS ① ~ ⑤ as above.</li> <li>2. Just at the point hold-down circuit begins to operate switch off the set.</li> <li>3. Remove the VR connected across CN4006, and measure it's resistance.</li> <li>4. Solder a resistor value, nearest to the measured value, across CN4007.</li> <li>5. Reconfirm operation check.</li> </ol>	<p>HIGH-VOLTAGE Voltmeter</p> <p>Dot pattern</p>	<p><input checked="" type="checkbox"/> marked parts C4057, D4026, R988, R4019, T4002, T4003 ( FBT ), E BOARD, HV Block</p> <p>HV Block</p> <p>CN4006</p> <p>HIGH-VOLTAGE Voltmeter <math>33.40 \pm 0.30\text{kVdc}</math></p>	<p><input checked="" type="checkbox"/> R988</p>	<p><b>E BOARD</b></p> <p>-COMPONENT SIDE-</p>

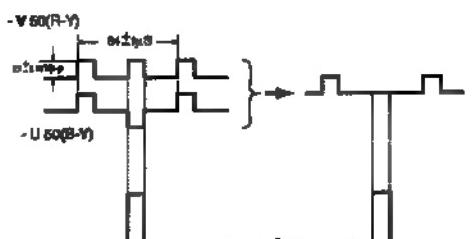
ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
<p><b>HV REGULATION CIRCUIT CHECK AND ADJUSTMENT</b></p> <p>When replacing the following components marked with <input checked="" type="checkbox"/> on the schematic diagram always check HV regulation, and if necessary re-adjust.</p> <p><b>OPERATION CHECK</b></p> <ol style="list-style-type: none"> <li>1. Connect a HV static voltmeter to the unconnected plug of the high-voltage block.</li> <li>2. Power on the set.</li> <li>3. Receive dot signal pattern.</li> <li>4. Check that the HV static voltmeter is reading <math>31.00 \pm 0.2\text{kVdc}</math>.</li> </ol> <p><b>HV Regulation adjustment</b></p> <ol style="list-style-type: none"> <li>1. Repeat step ① as above.</li> <li>2. Connect <math>68\text{k}\Omega</math> variable resistor, set to maximum value, to CN4006.</li> <li>3. Power on the set.</li> <li>4. Receive dot signal pattern.</li> <li>5. Gradually lower the value of the variable resistor until the static voltmeter is reading <math>31.00 \pm 0.20\text{kVdc}</math>.</li> <li>6. Switch off the set.</li> <li>7. Remove the VR connected across CN4006, and measure its value.</li> <li>8. Solder a resistor value, nearest to the measured value, across CN4006.</li> <li>9. Reconfirm operation check.</li> </ol>	<input checked="" type="checkbox"/> marked parts C4033, C4034, C4046, C4047, C4049, D4012, D4018, D4023, D4028, D4035, R983, R4022, R4046, R4047, R4048, R4053, R4054, R4057, R4059, R4060, R4061, R4077, R4079, R4086, R4087, R4088, R4091, R4092, R4097, R4098, R4100, Q4013, T4002, T4003 ( FBT ), <input checked="" type="checkbox"/> Board, HV Block HIGH-VOLTAGE Voltmeter $31.00 \pm 0.20\text{k Vdc}$ CN4006	<input checked="" type="checkbox"/> R983		 <p><b>E BOARD</b> -COMPONENT SIDE-</p> <p>CN4006</p> <p>CN4007</p>  <p><b>CN4006</b></p> <p><b>68KΩ</b></p>

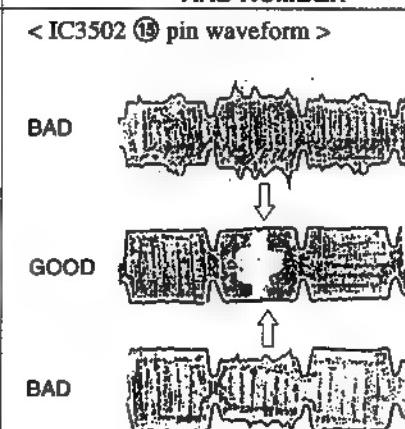
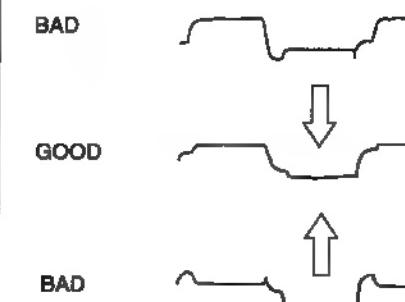
ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
<p><b>HV HOLD DOWN ADJUSTMENT WITHOUT USING STATIC HIGH VOLTAGE METER</b></p> <p>It is normally desirable that HV hold down and HV regulation checks uses a high voltage meter. However, sometimes one is not available, for example in the field, below is an adjustment method that can be used.</p> <ol style="list-style-type: none"> <li>1. Receive DOT signal ( PICTURE : 80%, BRIGHTNESS : 50% ).</li> <li>2. Turn off the power of the projector, and remove <input checked="" type="checkbox"/> R983 from CN4006 and <input checked="" type="checkbox"/> R988 from CN4007.</li> <li>3. Fix a <math>47k\Omega</math> VR onto CN4006 with solder, and set the resistor value at maximum. Fix a <math>68k\Omega</math> VR onto CN4007 with solder, and set the resistor value at minimum.</li> <li>4. Turn on the power of the projector. Connect a digital voltmeter to IC4001 ⑤ pin.</li> <li>5. Slowly turn the <math>47k\Omega</math> VR that is soldered to CN4006, and gradually lower the voltage of IC4001 ⑤ pin down to 1.67Vdc.</li> <li>6. Slowly turn the <math>68k\Omega</math> VR that is soldered to CN4007, and gradually raise the resistor value until the raster disappears and the HV hold down circuit starts operating.</li> <li>7. Turn off the power of the projector.</li> <li>8. Remove the <math>68k\Omega</math> VR from CN4007, and measure the resistor value with the digital voltmeter. Put a resistor ( metal oxide, 1/4W ) that has same value as the measured resistor onto CN4007 and solder it.</li> <li>9. Set the value of the <math>47k\Omega</math> VR on CN4006 at the maximum. Receive DOT signal ( PICTURE : 80%, BRIGHTNESS : 50% ).</li> <li>10. Turn on the power of the projector.</li> <li>11. Connect a digital voltmeter to IC 4001 ⑤ pin.</li> <li>12. Slowly turn down the <math>47k\Omega</math> VR that is connected to CN4006 to gradually lower the voltage of IC4001 ⑤ pin between 1.62 to 1.70Vdc, and check if the raster disappears and the hold down circuit operates.</li> <li>13. Turn off the power of the projector.</li> <li>14. Remove the <math>47k\Omega</math> VR from CN4006. Put back the removed <input checked="" type="checkbox"/> R983 onto CN4006 and solder it again.</li> </ol>	<p>Dot pattern</p> <p>Digital voltmeter</p>	<p>R983, R988</p> <p>IC4001 ⑤ pin</p>	<p><b>E BOARD</b> -COMPONENT SIDE-</p> <p>47kΩ VR ..... maximum 68kΩ VR ..... minimum</p> <p>PICTURE ..... 80% BRIGHTNESS ..... CENTER</p>	

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
<p><b>HV REGULATOR ADJUSTMENT WITHOUT USING STATIC HIGH VOLTMETER ( R983 )</b></p> <ol style="list-style-type: none"> <li>1. Receive DOT signal ( PICTURE : 80%, BRIGHTNESS : 50% ).</li> <li>2. Turn off the power of the projector.</li> <li>3. Remove R983 from CN4006.</li> <li>4. Fix a 47kΩ VR onto CN4006 with solder, and set the resistor value at maximum.</li> <li>5. Turn on the power of the projector. Connect a digital voltmeter to IC4001 ⑤ pin.</li> <li>6. Slowly turn the 47kΩ VR that is soldered to CN4006, and gradually lower the voltage of IC4001 ⑤ pin down to 1.49Vdc.</li> <li>7. Turn off the power of the projector.</li> <li>8. Remove the 47kΩ VR from CN4006, and measure the resistor value with the digital voltmeter. Put a resistor ( metal oxide, 1/4W ) that has same value as the measured resistor onto CN4006 and solder it.</li> <li>9. Turn on the power of the projector. Check if the voltage of IC4001 ⑤ pin is between 1.46 and 1.53Vdc.</li> <li>10. Receive FULL WHITE signal ( PICTURE : 80%, BRIGHTNESS : 50% ).</li> <li>11. Turn off the power of the projector.</li> </ol> <p><b>[ G BOARD ]</b></p> <p><b>+B MAX VOLTAGE CONFIRMATION</b></p> <p>The following adjustments should always be performed when replacing IC6002 and R6054.</p> <ol style="list-style-type: none"> <li>1. Supply 230VAC <b>III</b> with variable autotransformer.</li> <li>2. Input monoscope signal.</li> <li>3. Set the PICTURE control and the BRIGHTNESS controls to reset.</li> <li>4. Confirm the voltage of G BOARD CN6014 ① pin connector is less than <math>134.50 \pm 1.00</math>Vdc.</li> <li>5. If step 4 is not satisfied, replace IC6002 and R6054 repeat above steps.</li> </ol>	<p>Dot signal</p> <p>Digital voltmeter</p> <p>Full white pattern</p>	<p>R983</p> <p>PICTURE ..... 80%</p> <p>BRIGHTNESS ..... center</p> <p>IC4001 ⑤ pin</p> <p>PICTURE ..... 80%</p> <p>BRIGHTNESS ..... center</p> <p>CN6014 ① pin</p>	  <p>47kΩ</p> <p><b>G BOARD</b></p>  <p>Voltage of CN6014 ① pin Less than <math>134.50 \pm 1.00</math>Vdc</p>	

## SECTION 5 ELECTRICAL ADJUSTMENTS

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
<b>B BOARD ADJUSTMENT</b>				
<b>SUB COLOUR (SCOL) ADJUSTMENT</b>				
1. Input the PAL Colour Bar signal and adjustment the picture control. 2. Set to service mode. 3. Connect an oscilloscope between ④ pin of IC409 and ground. 4. Adjust SCOL so that $V_{CY} = V_{MG} = V_{BI}$ in the waveform levels. 5. Write the data to memory.	PAL Colour Bar pattern  Oscilloscope	IC409 ④ pin (B(3/4) Board)	PICTURE .... 80% RGB SCOL : $V_{CY} = V_{MG} = V_{BI}$	
<b>SUB HUE (MHUE,SHUE) ADJUSTMENT</b>				
1. Input the NTSC Colour Bar signal. 2. Set to service mode. 3. Connect an oscilloscope between ④ pin of IC409 and ground. 4. Adjust MHUE so that $V_{CY} = V_{MG}$ in the waveform levels. 5. Write the data to memory.	NTSC Colour Bar pattern  Oscilloscope	IC409 ④ pin (B(3/4) Board)	MCD MHUE : $V_{CY} = V_{MG}$	
<b>(PIP MODE)</b>				
1. Input the NTSC Colour Bar signal. 2. Select PIP on screen mode and put the set into service mode. 3. Connect an oscilloscope between ④ pin of IC409 and ground. 4. Adjust SHUE so that $V_{CY} = V_{MG}$ in the waveform levels. 5. Write the data to memory.	NTSC Colour Bar pattern  Oscilloscope	IC409 ④ pin (B(3/4) Board)	SCD SHUE : $V_{CY} = V_{MG}$	
<b>SUB CONTRAST (SCON) ADJUSTMENT</b>				
<b>(PIP MODE)</b>				
1. Input the PAL Colour Bar signal. 2. Select PIP on screen mode and put the set into service mode. 3. Connect an oscilloscope Q1 emitter on the B(1/4) board and ground. 4. Adjust SCON so that $V_{MAIN-Y} = V_{PIP-Y}$ in the waveform levels. 5. Write the data to memory.	PAL Colour Bar pattern  Oscilloscope	Q1 emitter (B(1/4) Board)	PIP SCON: $V_{MAIN-Y} = V_{PIP-Y}$	

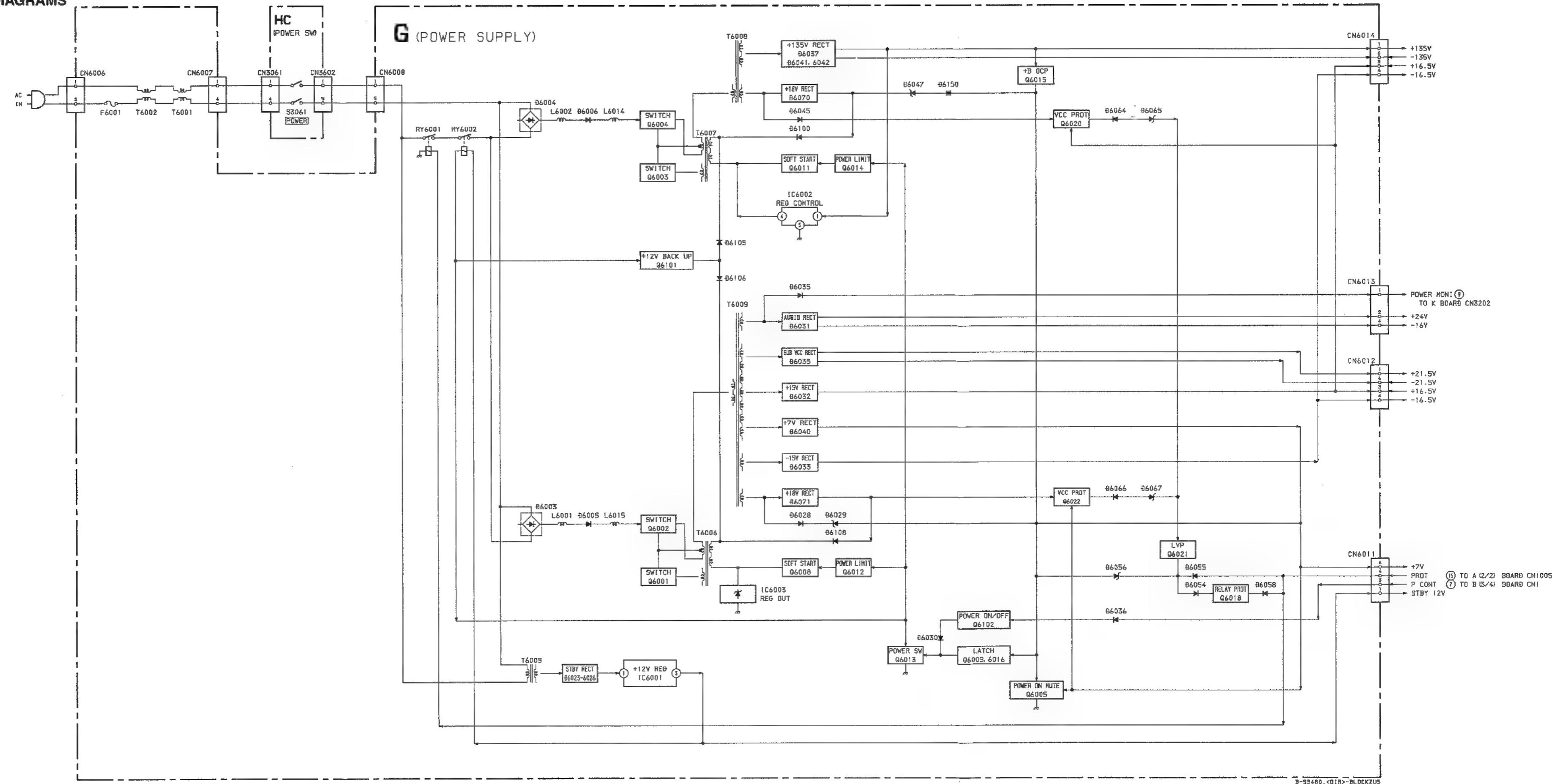
ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
<b>SUB WHITE BALANCE ADJUSTMENT</b>  (PIP MODE) 1. Input Gray Scale signal 20 IRE. 2. Select PIP in screen mode and put the set into service mode. 3. Connect an oscilloscope Q2 emitter on the B(1/4) board and ground. 4. Adjust RV1 so that V main = V <sub>PIP</sub> in the waveform levels. 5. Connect an oscilloscope Q7 emitter on the B(1/4) board and ground. 6. Adjust RV2 so that V main = V <sub>PIP</sub> in the waveform levels.	Oscilloscope	[ B(1/4) Board ] Q2 emitter (R-Y) Q7 emitter (B-Y)	[ B(1/4) Board ] RV1 (R-Y) RV2 (B-Y)	< Q2 emitter, Q7 emitter >  
<b>P IN P POSITION ADJUSTMENT</b>  1. Upon receiving the Monoscope signal. 2. Set service mode and then press the PIP command twice. The P in P positon will then move periodically to four points. Adjust " RDV " and " RDH " on the new screen so that the four points are distributed equally at ; up, down, left and right. 3. Write the data to memory.	Monoscope pattern		< PIP MENU > RDV RDH	
<b>TEXT POSITION ADJUSTMENT</b>  1. Receive the RF signal with TEXT. 2. Set to service mode. 3. Set the TEXT in MIX mode and adjust the screen positon with " TXH " and " TXV ". 4. Write the data to memory.			< TXT MENU > TXH (H position) TXV (V position)	
<b>OSD POSITION ADJUSTMENT</b>  1. Receive the PAL Colour Bar signal. 2. Set to service mode. 3. Adjust " OSH " so that the center line of the signal and the center of the crosshairs of the OSD display match are aligned with each other. 4. Write the data to memory.	PAL Colour Bar pattern		< CPU MENU > OSH	

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
<b>B2 BOARD ADJUSTMENT</b> <b>SECAM FILTER ADJUSTMENT</b> <ol style="list-style-type: none"> <li>1. Receive the SECAM Colour Bar signal.</li> <li>2. Adjust BELL filter by rotating L3503 so that ⑯ pin IC3502 should be flat/smooth chroma signal.</li> <li>3. Adjust B-Y filter by rotating L3505 so that Q3508 emitter (R-Y out) should get symmetrical transient between (R-Y)&gt;(B-Y) and (B-Y)&gt;(R-Y).</li> </ol>	SECAM Colour Bar pattern	IC3502 ⑯ pin Q3508 emitter	L3503 L3505	 <b>&lt; IC3502 ⑯ pin waveform &gt;</b>
<b>H. FREQUENCY ADJUSTMENT</b> <ol style="list-style-type: none"> <li>1. Connect a frequency counter to ⑯ pin of IC3501.</li> <li>2. Adjust RV3501 so that the frequency counter is <math>15.625\text{KHz} \pm 50\text{Hz}</math>.</li> <li>3. Input a SECAM Colour Bar signal/p.</li> <li>4. Confirm that ⑯ pin of IC3501 should be <math>15.625\text{KHz} \pm 50\text{Hz}</math>.</li> </ol>	SECAM Colour Bar pattern	RV3501	IC3501 ⑯ pin	 <b>&lt; Q3508 emitter waveform &gt;</b>

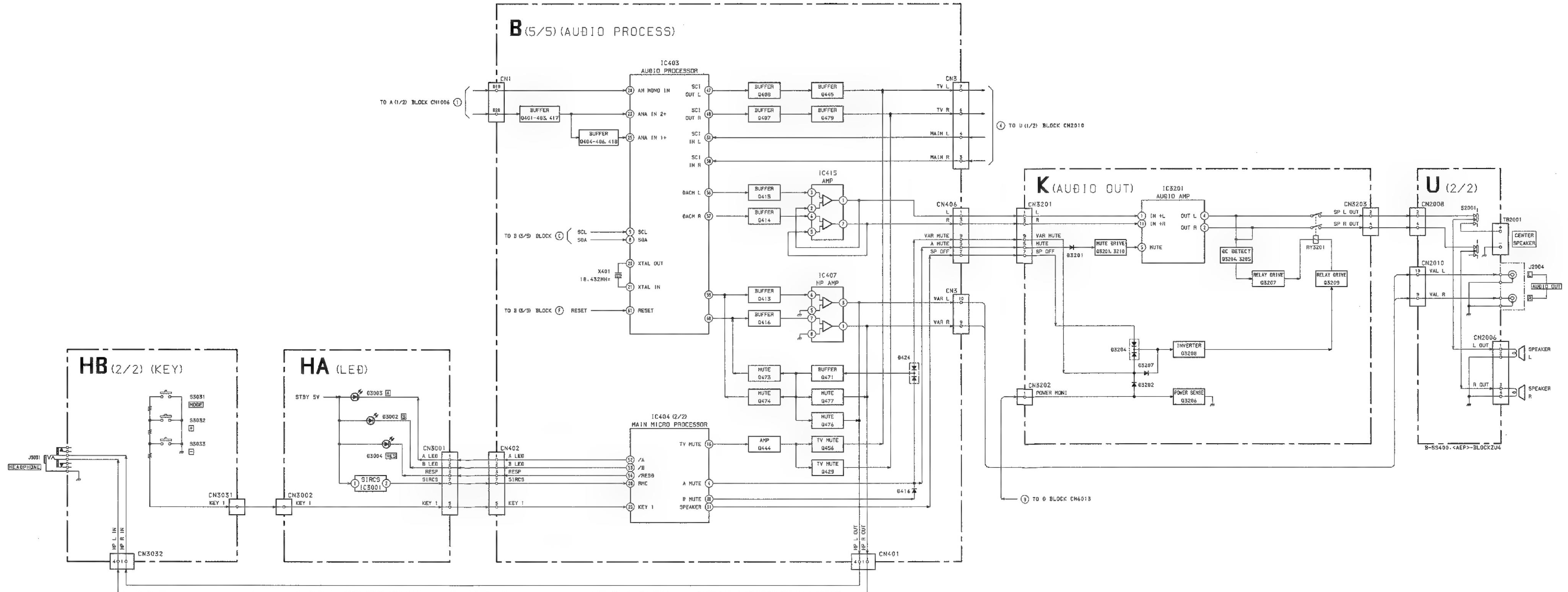
ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
<b>A BOARD ADJUSTMENT</b>				
<b>V BLANKING SIZE ADJUSTMENT</b> <ol style="list-style-type: none"> <li>1. Receive PAL monoscope signal.</li> <li>2. Select "BKU" in D/A menu.</li> <li>3. Reduce the data value by pressing [3] and [6] on the commander to adjust blanking size and minimize the shear on the screen top.</li> <li>4. Select "BKD" in D/A menu.</li> <li>5. Increase the data value by pressing [3] and [6] on the commander to adjust blanking size and minimize the shear on the screen bottom.</li> </ol>	PAL Monoscope pattern			
<b>H SIZE ADJUSTMENT</b> <ol style="list-style-type: none"> <li>1. Receive a PAL monoscope signal.</li> <li>2. Set to Service Mode.</li> <li>3. Select H SIZE of VSP menu with the commander buttons [1] and [4].</li> <li>4. Adjust to <math>15.4 \pm 0.2</math> square with [3] and [6].</li> </ol>	PAL Monoscope pattern			
<b>S CORRECTION ADJUSTMENT</b> <ol style="list-style-type: none"> <li>1. Receive a PAL monoscope signal.</li> <li>2. Set to Service Mode.</li> <li>3. Select VSCO of VSP menu with the commander buttons [1] and [4].</li> <li>4. Adjust to data "00" with [3] and [6].</li> </ol>	PAL Monoscope pattern			
<b>V SIZE ADJUSTMENT</b> <ol style="list-style-type: none"> <li>1. Receive a PAL monoscope signal.</li> <li>2. Set to Service Mode.</li> <li>3. Select V SIZE of VSP menu with the commander buttons [1] and [4].</li> <li>4. Adjust to <math>11.6 \pm 0.2</math> square with [3] and [6].</li> </ol>	PAL Monoscope pattern			

**SECTION 6  
DIAGRAMS**

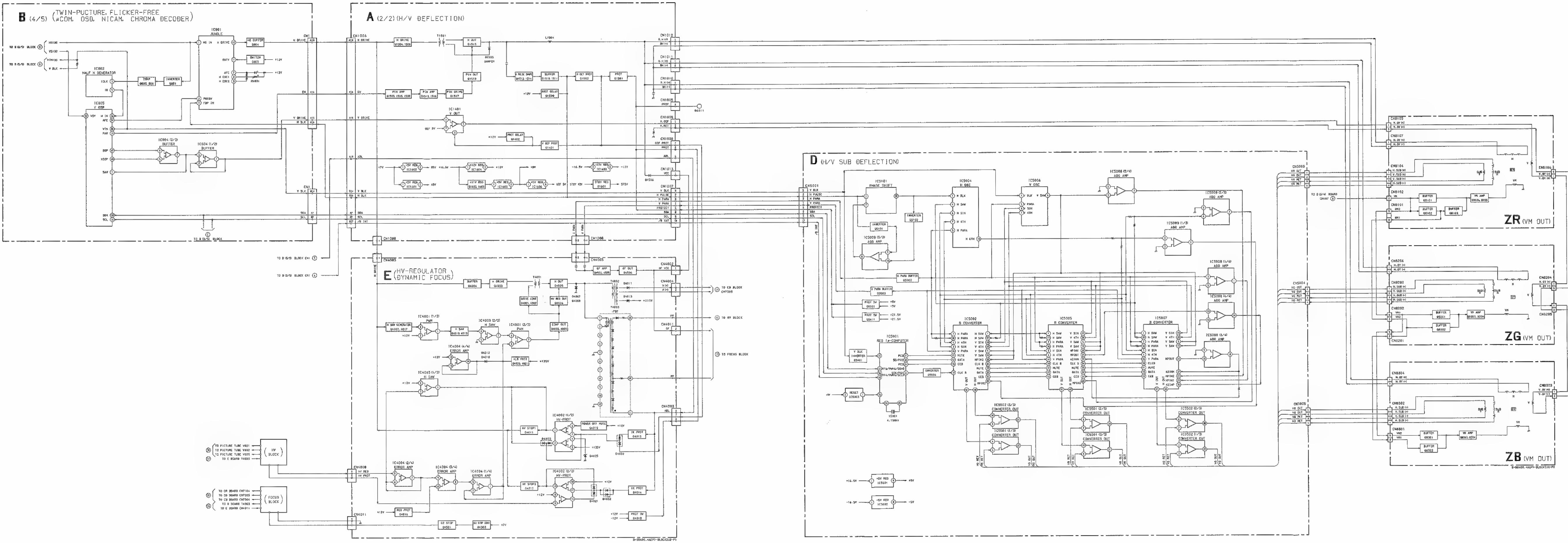
**6-1. BLOCK DIAGRAM (1)**



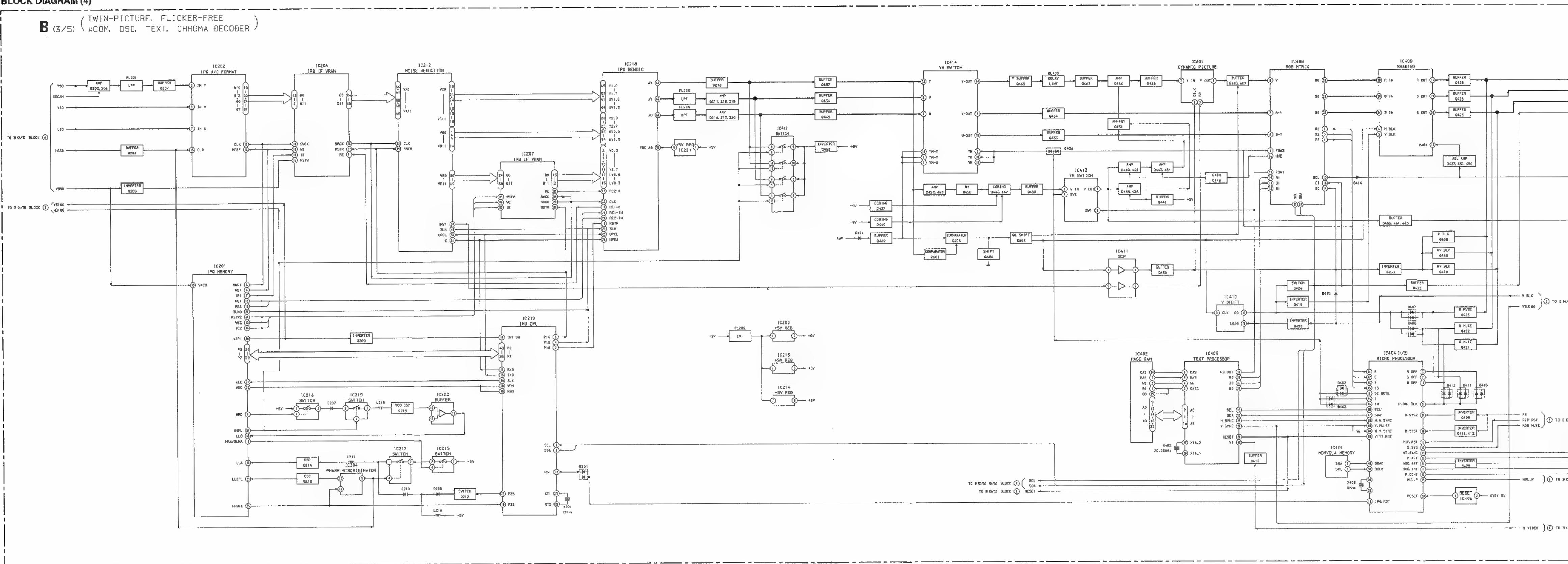
BLOCK DIAGRAM (2)



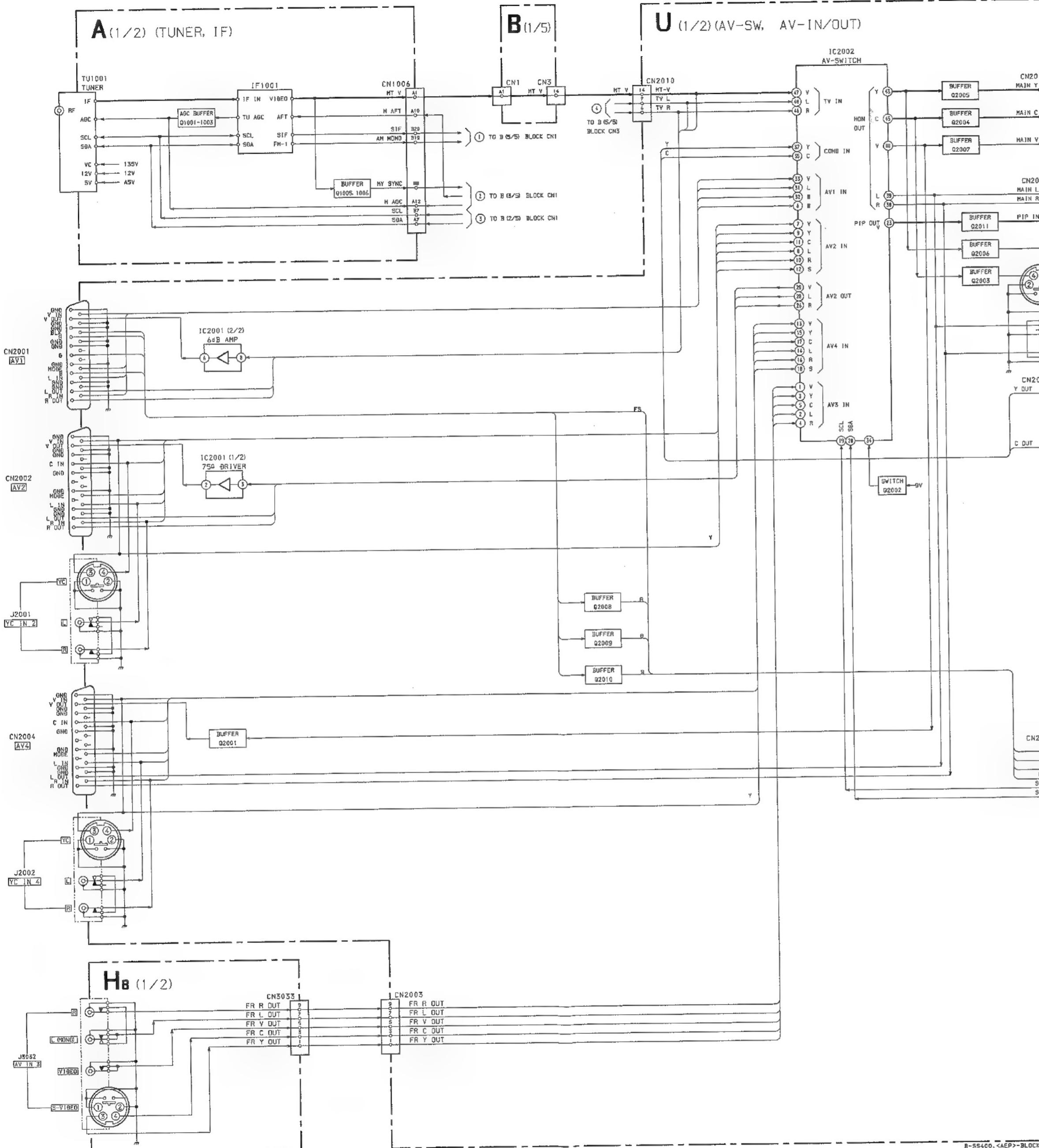
### BLOCK DIAGRAM (3)



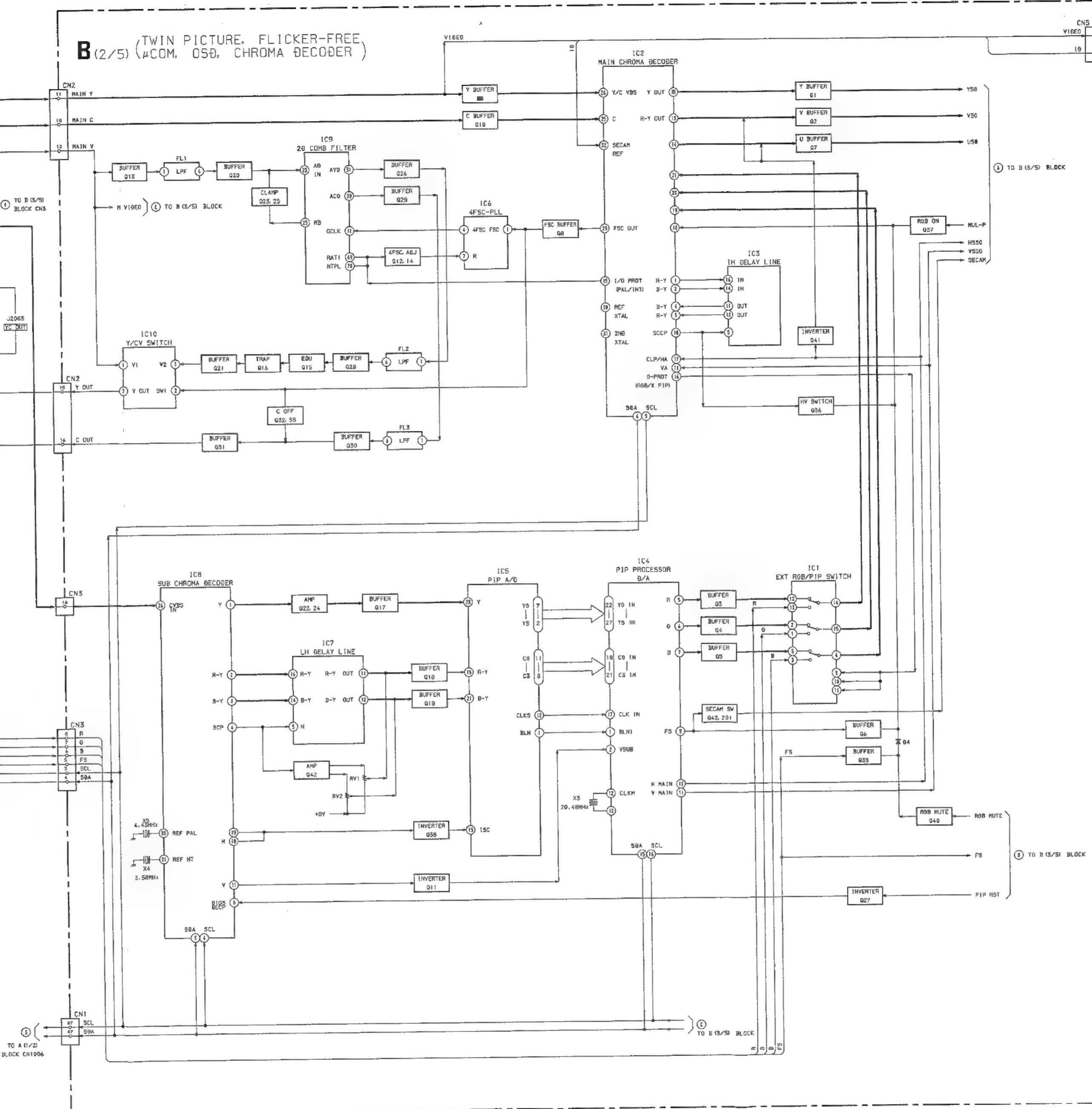
BLOCK DIAGRAM (4)

B (3/5) (TWIN-PICTURE, FLICKER-FREE  
μCOM, OSD, TEXT, CHROMA DECODER)E-55400-**AEP**-BLOCKZUS-P1

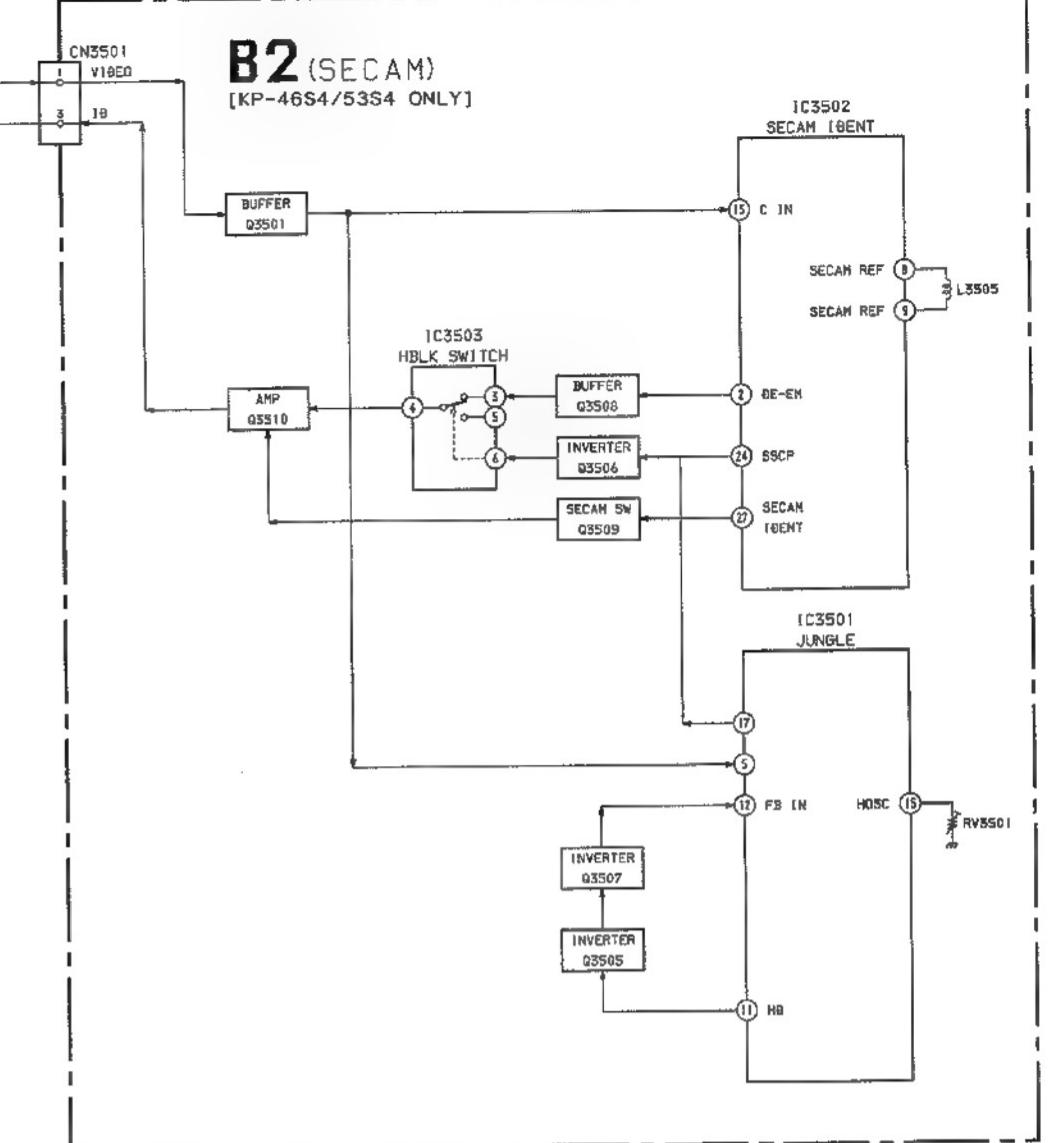
BLOCK DIAGRAM (5)



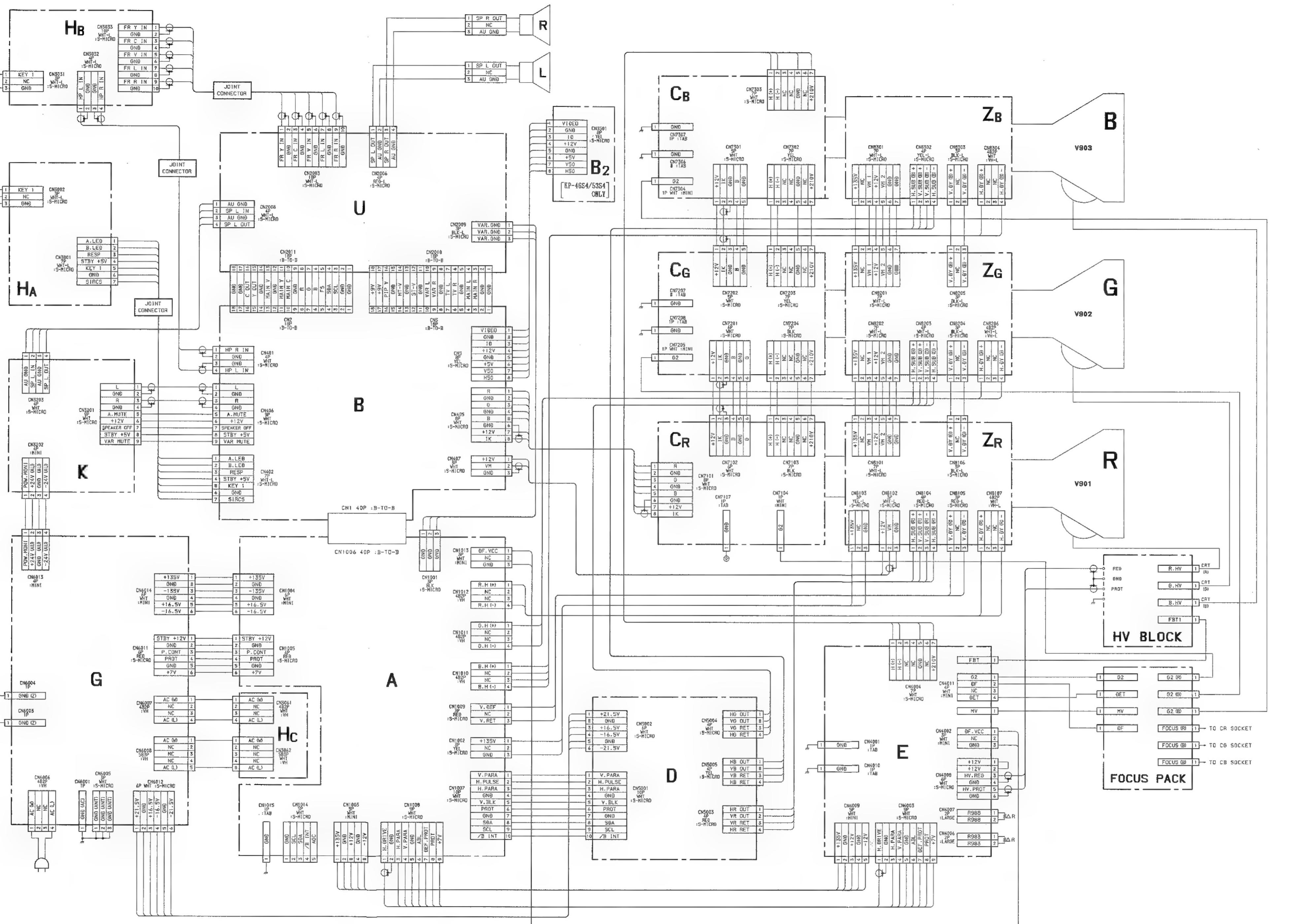
B (2/5) (TWIN PICTURE, FLICKER-FREE)



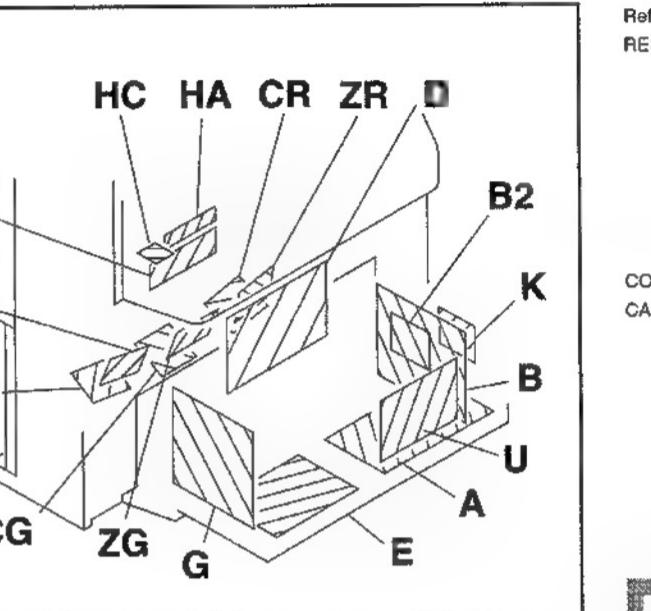
B2 (SECAM) (KP-4654/5354 ONLY)



## **1. FRAME SCHEMATIC DIAGRAM**



## CIRCUIT BOARDS LOCATION



# **PRINTED WIRING BOARDS AND CIRCUIT DIAGRAMS**

Capacitors without voltage indication are all 50V  
Capacitors are in  $\mu\text{F}$  unless otherwise noted.

specifi	The sy	Repla
itors are in ohms.		
0Ω, MΩ=1000kΩ		
on of resistance, which dose not have one for rating electrical power, is		
ws.		
: 5mm		
ng electrical power : 1/4W		
resistance, 1/10 W and 1/8 W ■ chip resistance.		
: nonflammable resistor.		
■ : fusible resistor.		
internal component.		
able and adjustable resistors have characteristic curve B, unless otherwise		
earth-chassis.		
components identified by ■ in this basic schematic diagram have been		
ly factory-selected for each set in order to satisfy regulations regarding		
adiation.		
replacement be required, replace only with the value originally used.		
Replacing components identified by ■, make the necessary adjustments		
ed. If results do not meet the specified value, change the component		
ed by ■ and repeat the adjustment until the specified value is achieved.		
— P202, P203 adjustment on Page 46-47)		

Part replaced ( <input checked="" type="checkbox"/> )	Adjustment ( <input checked="" type="checkbox"/> )	
D4026, R988, R4019, T4002, (FBT), E BOARD, HV BLOCK	HOLD-DOWN (R988)	(7) Dia
C4034, C4046, C4047,C4049, D4012, D4023, D4028, D4035,R983, R4022, R4047, R4048, R4053, R4054, R4057, R4060, R4061, R4077, R4079, R4086, R4088, R4091, R4092, R4097, R4098, Q4013,	HOLD-DOWN (R983)	(8) Dia
T4003 ( FBT ), E Board , HV Block		(9) Dia
		(10) Dia
		(11) Dia

replacing the part in below table, be sure to perform the related adjustment.  
 ings are taken with a color-bar signal input.

ark : PAL  
 ) : SECAM  
 ) : NTSC 3.58

ings are taken with a  $10M\Omega$  digital multimeter.

es are dc with respect to ground unless otherwise noted.

e variations may be noted due to normal production tolerances.

ages are in V.

measurement impossibility.

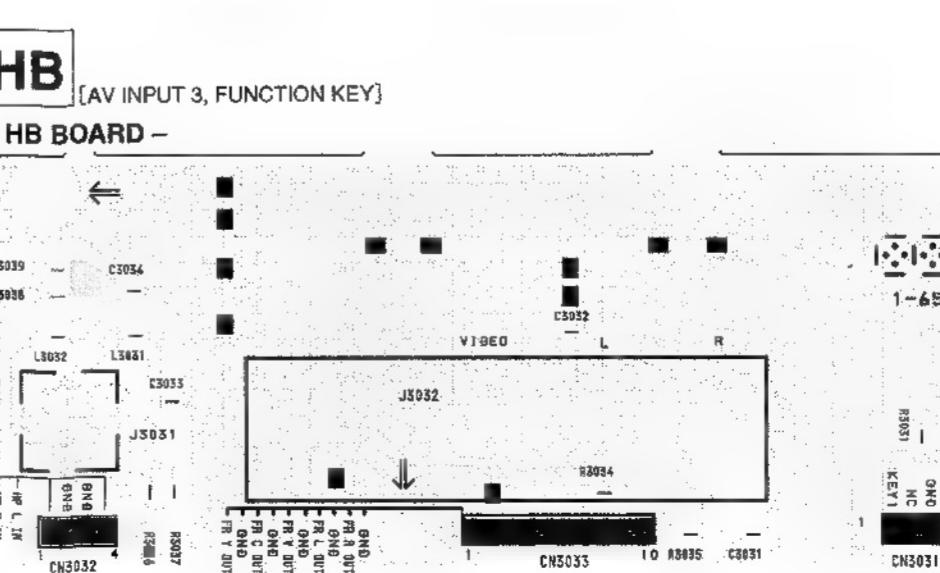
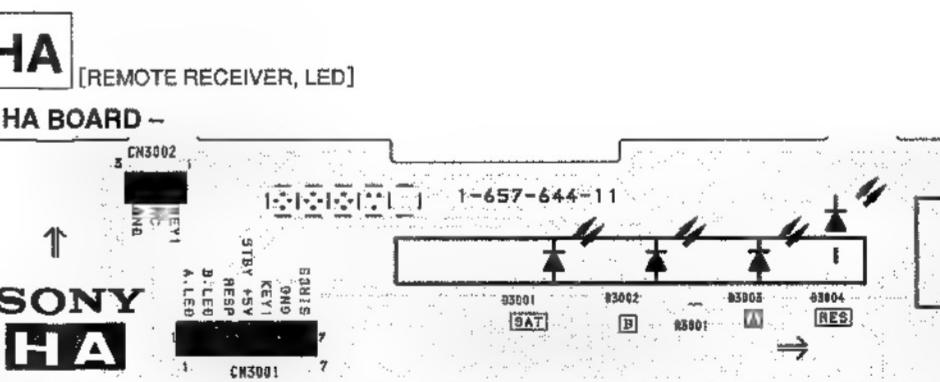
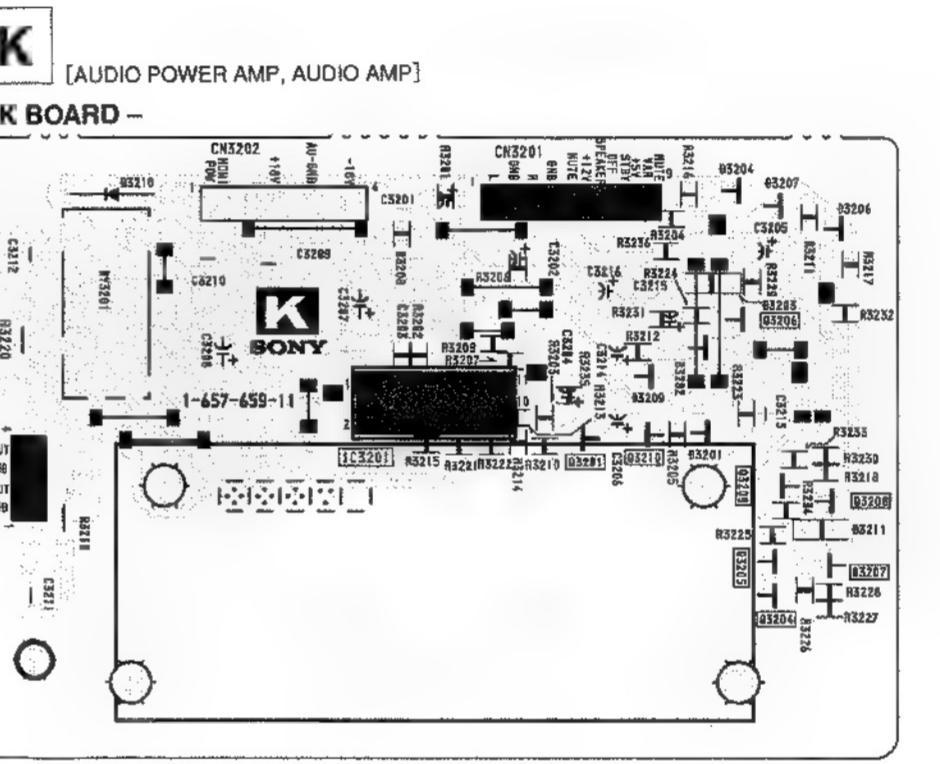
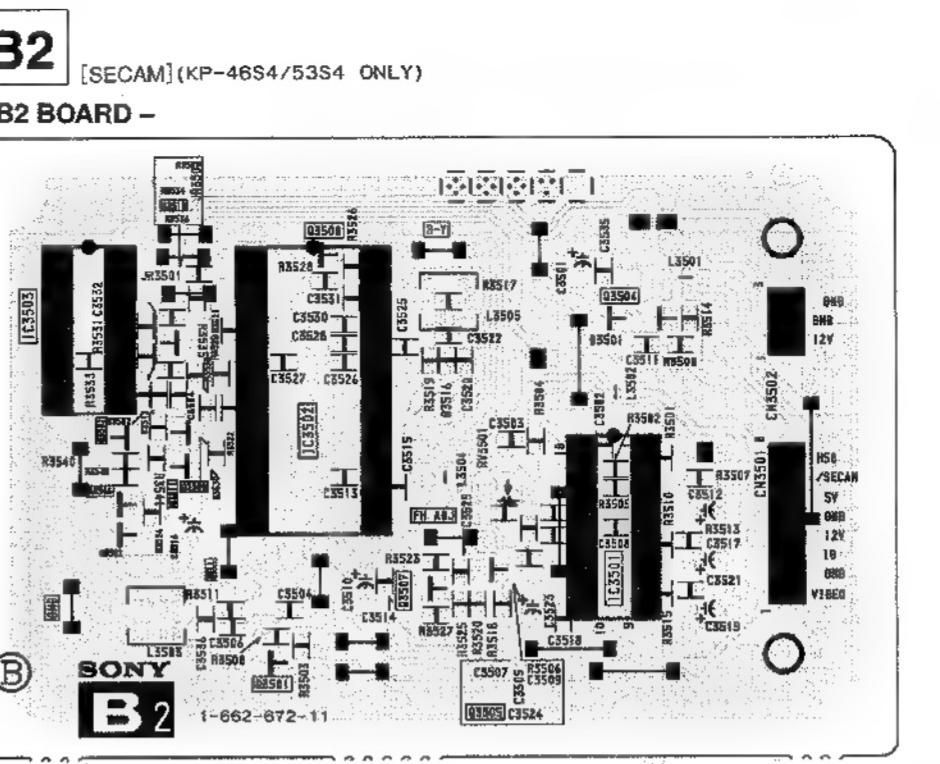
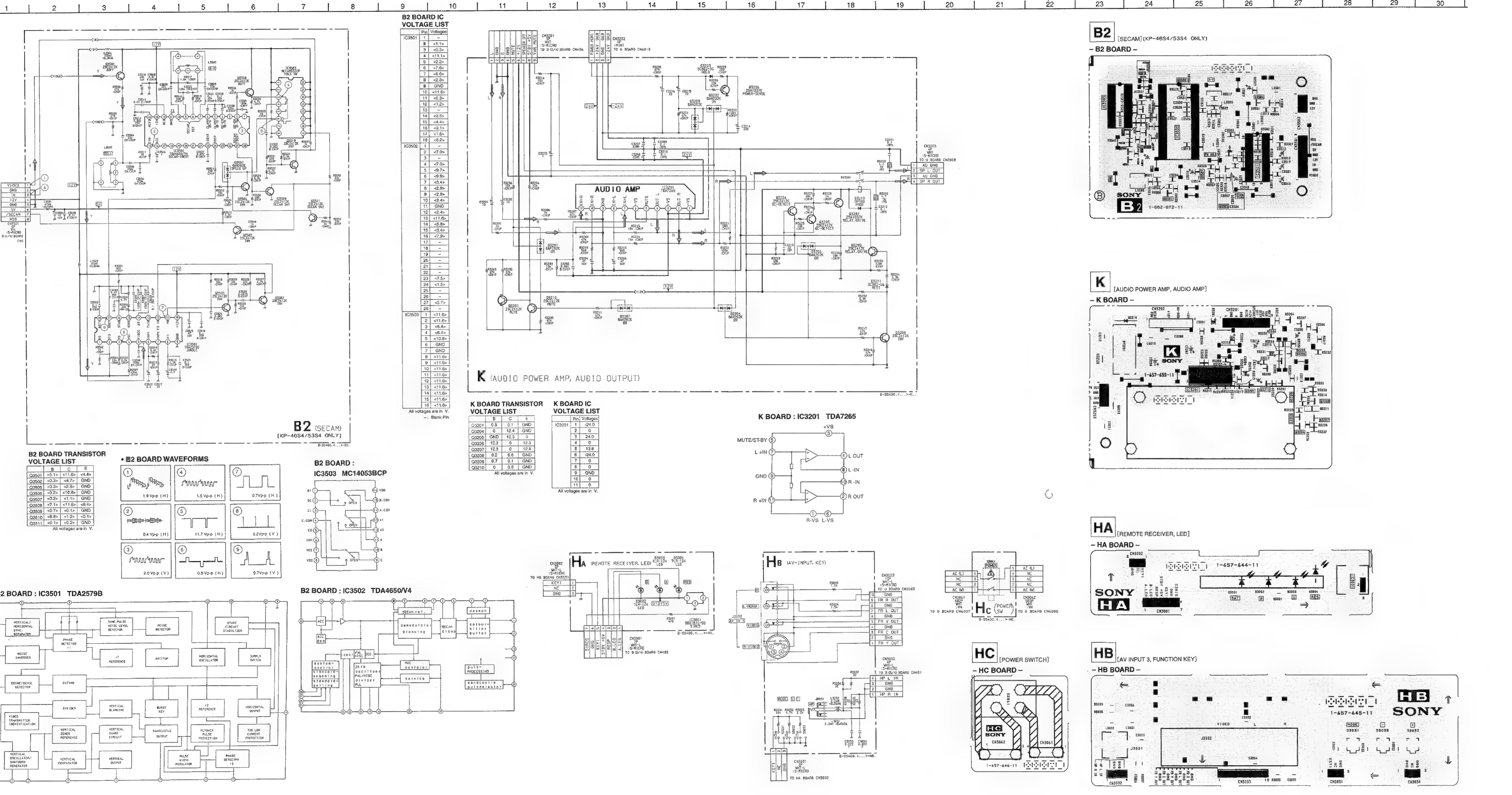
: B+line.

: B-line.

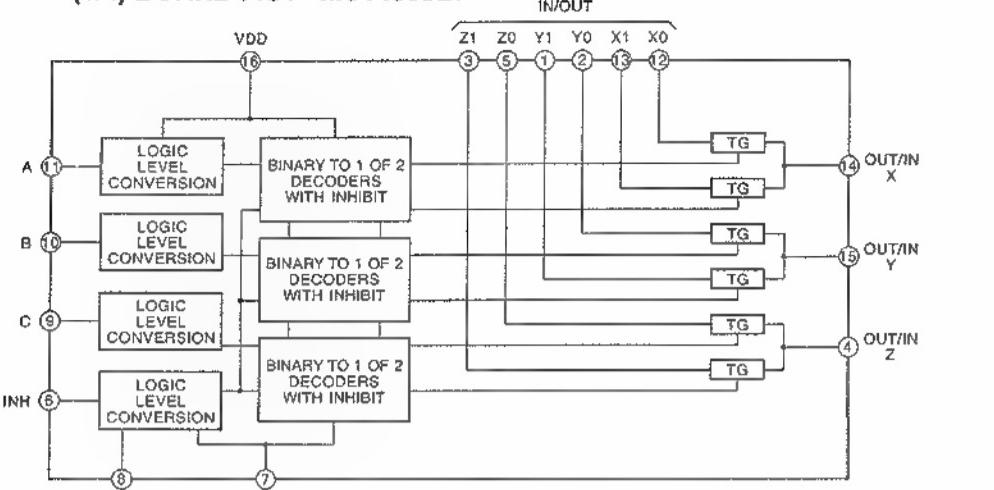
I measured value may be different).

> : signal path.

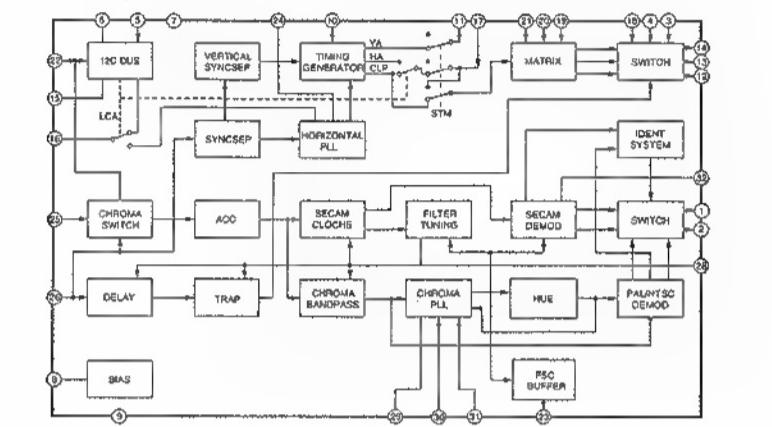
d numbers are waveform references.



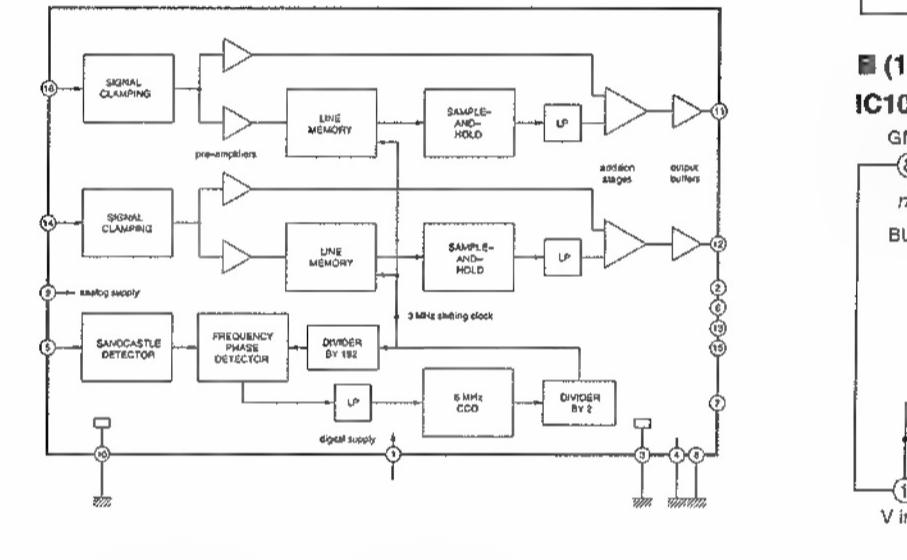
B (1/4) BOARD : IC1 MC14053BF



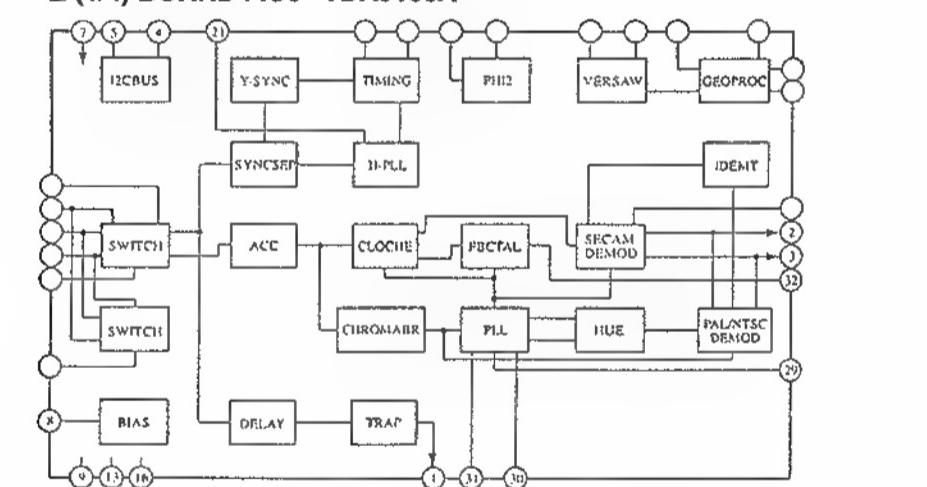
B (1/4) BOARD : IC2 TDA9141-N2C



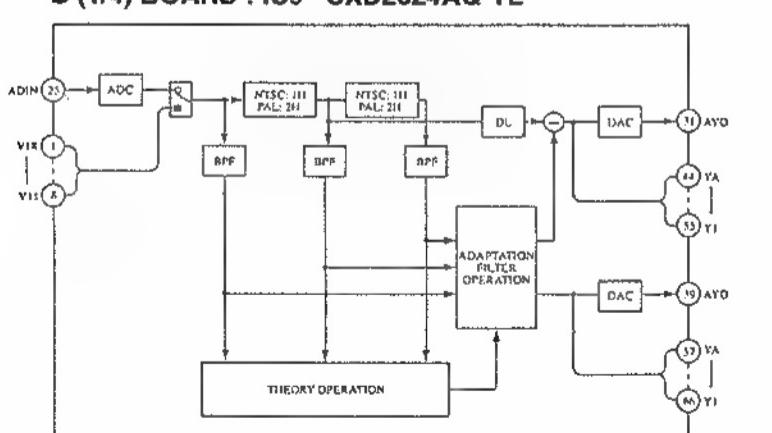
B (1/4) BOARD : IC3 TDA4665T



B (1/4) BOARD : IC8 TDA9160A



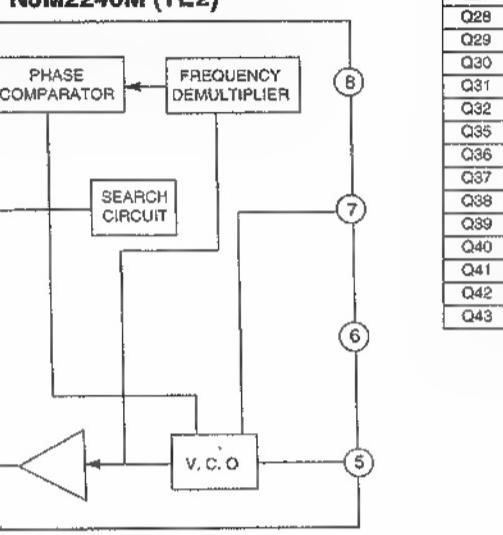
B (1/4) BOARD : IC9 CXD2024AQ-TL



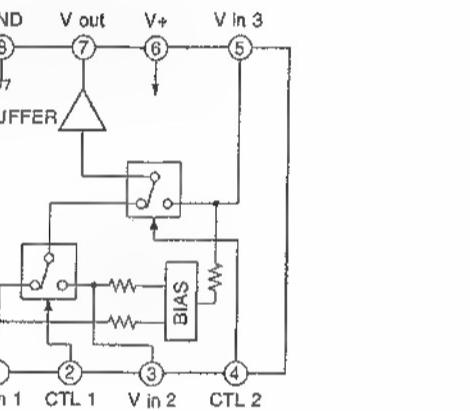
B(1/4) BOARD TRANSISTOR VOLTAGE LIST

	C	E
Q1	3.2	7.6
Q2	2.6	2.0
Q3	0	GND
Q4	0	GND
Q5	0	GND
Q6	2.6	0.7
Q7	0.1	8.8
Q8	5.1	GND
Q9	0	8.8
Q10	0	4.4
Q11	3.8	0.3
Q12	0.4	4.6
Q13	3.5	4.8
Q14	4.6	4.4
Q15	2.7	0.7
Q16	3.0	8.0
Q17	3.0	8.0
Q18	3.1	4.8
Q19	2.7	2.0
Q20	2.3	1.5
Q21	2.8	2.0
Q22	7.0	2.7
Q23	1.1	4.8
Q24	2.8	1.7
Q25	7.0	1.7
Q26	1.4	GND
Q27	0	5.0
Q28	2.3	GND
Q29	1.6	GND
Q30	2.4	GND
Q31	0	4.7
Q32	2.4	0
Q33	0	2.4
Q34	0.5	GND
Q35	0.7	1.6
Q36	0.1	4.4
Q37	0.1	GND
Q38	0.4	0.7
Q39	0	7.0
Q40	0	6.9
Q41	0	8.5
Q42	1.6	1.0
Q43	0	0.6

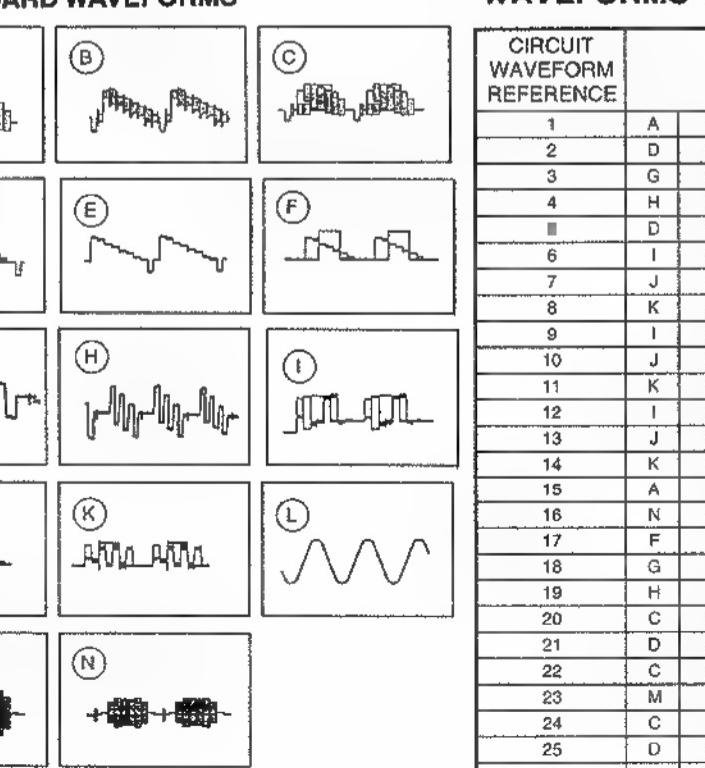
B (1/4) BOARD : IC6 NJM2240M (TE2)



B (1/4) BOARD : IC10 NJM2235M



• B (1/4) BOARD WAVEFORMS

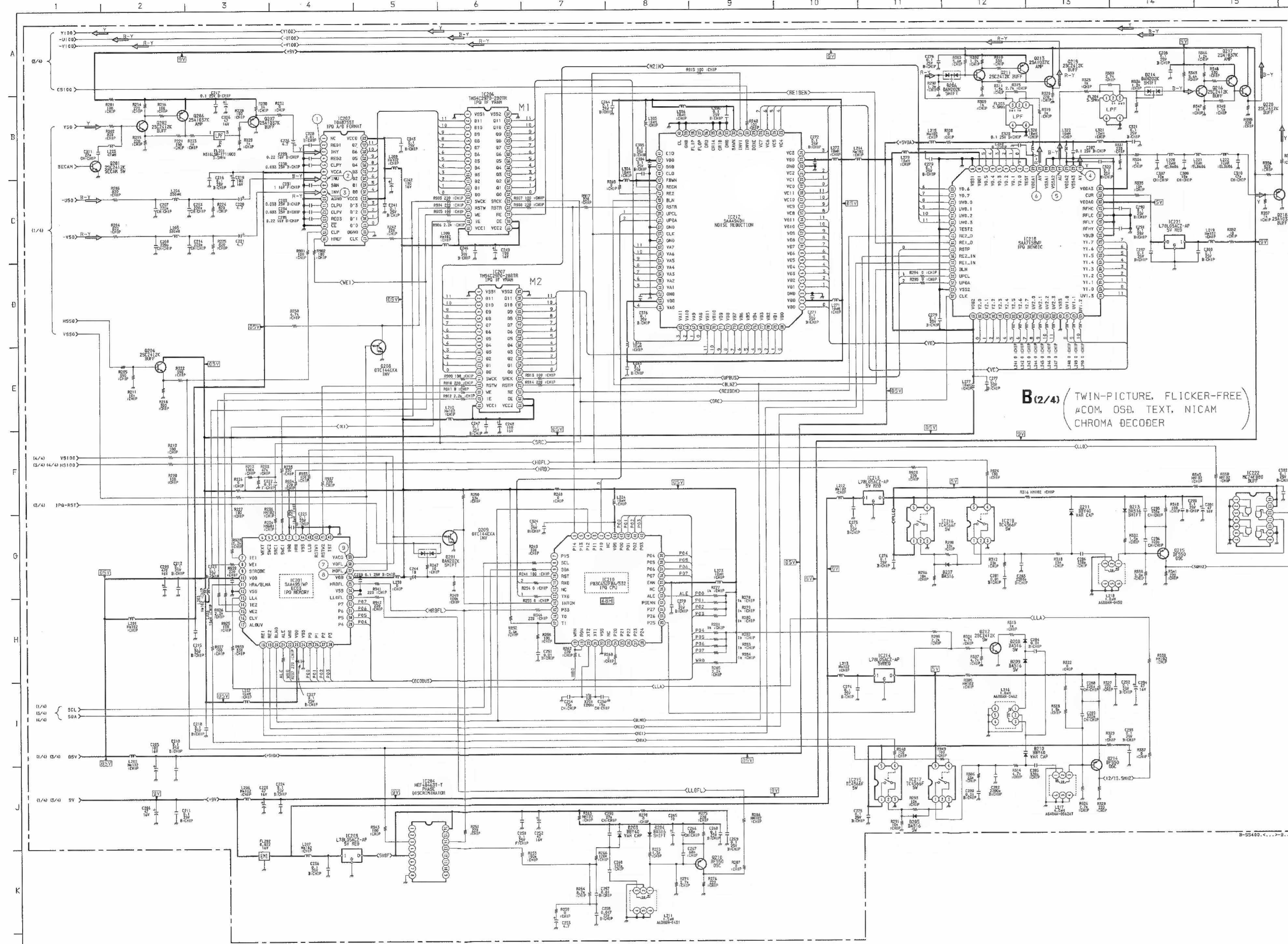


WAVEFORMS B (1/4) BOARD

CIRCUIT WAVEFORM REFERENCE	PAL	SECAM	NTSC 3.58 4.43
1	A 1.2Vp-p(H)	B 1.0Vp-p(H)	C 1.1Vp-p(H)
2	D 0.6Vp-p(H)	E 0.4Vp-p(H)	D 0.8Vp-p(H)
3	G 0.7Vp-p(H)	G 1.2Vp-p(H)	G 0.8Vp-p(H)
4	H 0.8Vp-p(H)	H 1.5Vp-p(H)	H 0.7Vp-p(H)
5	D 1.2Vp-p(H)	E 0.8Vp-p(H)	D 0.9Vp-p(H)
6	I 0.8Vp-p(H)	I 1.0Vp-p(H)	I 0.8Vp-p(H)
7	J 0.8Vp-p(H)	J 1.0Vp-p(H)	J 0.7Vp-p(H)
8	K 0.9Vp-p(H)	K 0.9Vp-p(H)	K 0.7Vp-p(H)
9	I 0.9Vp-p(H)	I 0.9Vp-p(H)	J 0.7Vp-p(H)
10	J 0.9Vp-p(H)	J 0.9Vp-p(H)	J 0.7Vp-p(H)
11	K 0.8Vp-p(H)	K 0.8Vp-p(H)	K 0.8Vp-p(H)
12	I 0.8Vp-p(H)	-	I 0.8Vp-p(H)
13	J 0.8Vp-p(H)	-	J 0.8Vp-p(H)
14	K 0.8Vp-p(H)	-	K 0.8Vp-p(H)
15	A 1.2Vp-p(H)	-	-
16	N 0.9Vp-p(H)	-	-
17	F 1.3Vp-p(H)	F 1.1Vp-p(H)	F 1.1Vp-p(H)
18	G 1.2Vp-p(H)	G 1.0Vp-p(H)	G 1.0Vp-p(H)
19	H 1.7Vp-p(H)	H 1.5Vp-p(H)	H 1.3Vp-p(H)
20	C 2.5Vp-p(H)	-	-
21	D 2.3Vp-p(H)	-	-
22	C 2.3Vp-p(H)	-	-
23	M 1.8Vp-p(H)	-	-
24	C 1.9Vp-p(H)	-	-
25	D 2.7Vp-p(H)	-	-
26	N 2.5Vp-p(H)	-	-

B(1/4) BOARD IC VOLTAGE LIST

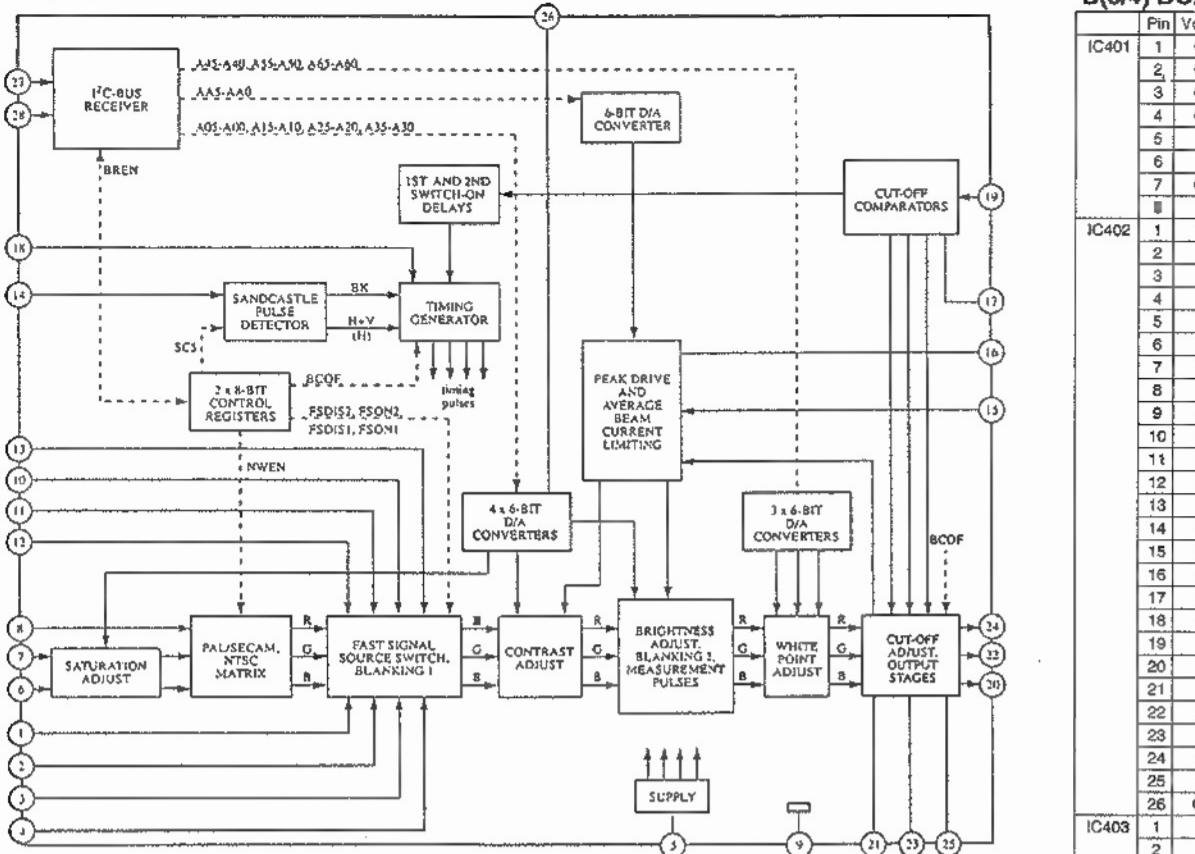
Pin	Voltages	Pin	Voltages
IC1	1 0.8	25 1.3±1.7	
Q2	2 0.8	26 0.8	
Q3	3 0	27 1.0	
Q4	4 0.8	28 4.8	
Q5	5 0.8	29 5	
Q6	6 GND	30 6	
Q7	7 GND	31 7	
Q8	8 2.6	32 8	
Q9	9 0.1	33 9	
Q10	10 0	34 1.9	
Q11	11 0.8	35 6.2±1.1	
Q12	12 0.8	36 7 1.8±1.3	
Q13	13 0	37 8 0.8±1.5	
Q14	14 0.8	38 13 4.8	
Q15	15 0.8	39 14 4.8	
Q16	16 0.8	40 15 2.5	
Q17	17 0.8	41 16 4.8	
Q18	18 0.8	42 17 4.6	
Q19	19 0.8	43 18 4.8	
Q20	20 0.8	44 19 4.8	
Q21	21 0.8	45 20 4.6	
Q22	22 0.8	46 21 1	
Q23	23 0.8	47 22 1	
Q24	24 0.8	48 23 1	
Q25	25 0.8	49 24 1	
Q26	26 0.8	50 25 1	
Q27	27 0.8	51 26 1	
Q28	28 0.8	52 27 1	
Q29	29 0.8	53 28 1	
Q30	30 0.8	54 29 1	
Q31	31 0.8	55 30 1	
Q32	32 0.8	56 31 1	
Q33	33 0.8	57 32 1	
Q34	34 0.8	58 33 1	
Q35	35 0.8	59 34 1	
Q36	36 0.8	60 35 1	
Q37	37 0.8	61 36 1	
Q38	38 0.8	62 37 1	
Q39	39 0.8	63 38 1	
Q40	40 0.8	64 39 1	
Q41	41 0.8	65 40 1	
Q42	42 0.8	66 41 1	
Q43	43 0.8	67 42 1	
Q44	44 0.8	68 43 1	
Q45	45 0.8	69 44 1	
Q46	46 0.8	70 45 1	
Q47	47 0.8	71 46 1	
Q48	48 0.8	72 47 1	
Q49	49 0.8	73 48 1	
Q50	50 0.8	74 49 1	
Q51	51 0.8	75 50 1	
Q52	52 0.8	76 51 1	
Q53	53 0.8	77 52 1	
Q54	54 0.8	78 53 1	
Q55	55 0.8	79 54 1	
Q56	56 0.8	80 55 1	
Q57	57 0.8	81 56 1	
Q58	58 0.8	82 57 1	
Q59	59 0.8	83 58 1	
Q60	60 0.8	84 59 1	
Q61	61 0.8	85 60 1	
Q62	62 0.8	86 61 1	
Q63	63 0.8	87 62 1	
Q64	64 0.8	88 63 1	
Q65	65 0.8	89 64 1	
Q66	66 0.8	90 65 1	
Q67	67 0.8	91 66 1	
Q68	68 0.8	92 67 1	
Q69	69 0.8	93 68 1	
Q70	70 0.8	94 69 1	
Q71	71 0.8	95 70 1	
Q72	72 0.8	96 71 1	
Q73	73 0.8	97 72 1	
Q74	74 0.8	98 73 1	
Q75	75 0.8	99 74 1	
Q76	76 0.8	100 75 1	
Q77	77 0.8	101 76 1	
Q78	78 0.8	102 77 1	
Q79	79 0.8	103 78 1	
Q80	80 0.8	104 79 1	
Q81	81 0.8	105 80 1	
Q82	82 0.8	106 81 1	
Q83	83 0.8	107 82 1	
Q84	84 0.8	108 83 1	
Q85	85 0.8	109 84 1	
Q86	86 0.8	110 85 1	
Q87	87 0.8	111 86 1	
Q88	88 0.8	112 87 1	
Q89	89 0.8	113 88 1	
Q90	90 0.8	114 89 1	
Q91	91 0.8	115 90 1	
Q92	92 0.8	116 91 1	
Q93	93 0.8	117 92 1	
Q94	94 0.8	118 93 1	
Q95	95 0.8	119 94 1	
Q96	96 0.8	120 95 1	
Q97	97 0.8	121 96 1	
Q98	98 0.8	122 97 1	
Q99	99 0.8	123 98 1	
Q100	100 0.8	124 99 1	
Q101	101 0.8	125 10	



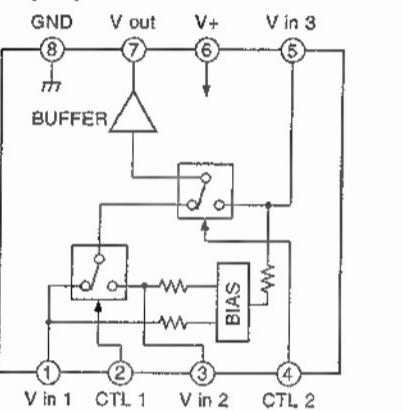
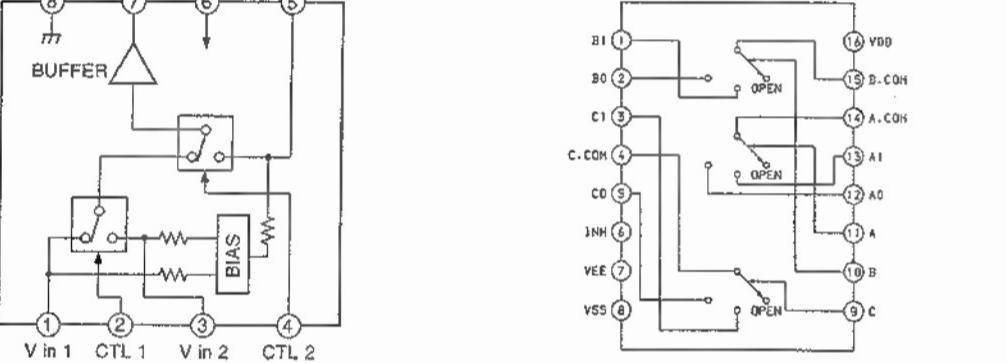
**B(2/4) BOARD IC VOLTAGE LIST**

Pin	Voltages	Pin	Voltages	Pin	Voltages	Pin	Voltages	Pin	Voltages
IC201	1 2.0	5 0.4	32 1.8	33 GND	13 2.1	34 GND	14 2.1	35 GND	15 1.5
	2 4.8	4 -	33 1.8	34 GND	16 GND	35 1.2	36 -	37 1.7	37 1.7
	3 1.7	5 0.5	34 1.8	35 GND	17 1.7	36 -	38 -	39 GND	18 0
	4 2.4	6 -	35 1.2	36 GND	19 0.3	37 1.7	38 -	39 GND	20 0.7
	5 -	7 -	36 GND	37 -	21 0.3	38 GND	22 0.7	23 0.7	24 4.8
	6 -	8 GND	37 -	21 0.3	38 GND	22 0.7	23 0.7	24 4.8	25 GND
	7 4.8	9 -	38 GND	39 GND	25 2.5	40 GND	26 0.7	27 1.8	28 1.8
	8 3.8	10 -	39 GND	40 GND	26 1.4	41 -	27 1.8	28 1.8	29 1.8
	9 -	11 -	40 GND	41 -	28 1.4	42 4.8	29 1.8	30 1.8	31 2.0
	10 4.8	12 -	41 -	32 2.3	33 1.0	42 4.8	33 1.0	34 1.0	35 1.0
	11 2.5	13 2.7	34 1.0	35 1.0	36 1.0	43 GND	37 1.0	38 1.0	39 1.0
	12 GND	14 2.5	37 1.0	38 1.0	39 1.0	44 GND	39 1.0	40 1.0	41 1.0
	13 1.1	15 2.0	40 GND	41 1.0	42 1.0	45 GND	42 1.0	43 1.0	44 1.0
	14 4.8	16 5.0	42 1.0	43 1.0	44 1.0	46 GND	43 1.0	44 1.0	45 1.0
	15 2.0	17 4.8	44 1.0	45 1.0	46 1.0	47 GND	44 1.0	45 1.0	46 1.0
	16 1.4	18 4.8	47 GND	48 0	49 0	48 0	47 1.0	48 1.0	49 1.0
	17 -	19 4.8	49 0	50 0.7	51 0.7	49 0	50 0.7	51 0.7	52 0.7
	18 3.7	20 1.4	51 0.7	52 0.7	53 0.7	52 0.7	53 0.7	54 0.7	55 0.7
	19 5.7	21 1.4	53 0.7	54 0.7	55 0.7	54 0.7	55 0.7	56 0.7	57 0.7
	20 4.2	22 2.2	55 0.7	56 0.7	57 0.7	56 0.7	57 0.7	58 0.7	59 0.7
	21 1.4	23 1.0	58 0.7	59 0.7	60 0.7	59 0.7	60 0.7	61 0.7	62 0.7
	22 4.8	24 0.8	60 0.7	61 0.7	62 0.7	61 0.7	62 0.7	63 0.7	64 0.7
	23 1.0	25 1.0	62 0.7	63 0.7	64 0.7	63 0.7	64 0.7	65 0.7	66 0.7
	24 1.0	26 1.0	64 0.7	65 0.7	66 0.7	65 0.7	66 0.7	67 0.7	68 0.7
	25 1.0	27 1.0	67 0.7	68 0.7	69 0.7	68 0.7	69 0.7	70 0.7	71 0.7
	26 1.0	28 1.0	70 0.7	71 0.7	72 0.7	71 0.7	72 0.7	73 0.7	74 0.7
	27 1.0	29 1.0	72 0.7	73 0.7	74 0.7	73 0.7	74 0.7	75 0.7	76 0.7
	28 1.0	29 1.0	75 0.7	76 0.7	77 0.7	76 0.7	77 0.7	78 0.7	79 0.7
	29 1.0	30 1.0	77 0.7	78 0.7	79 0.7	78 0.7	79 0.7	80 0.7	81 0.7
	30 1.0	31 0.0	80 0.7	81 0.7	82 0.7	81 0.7	82 0.7	83 0.7	84 0.7
	31 0.0	32 0.0	82 0.7	83 0.7	84 0.7	83 0.7	84 0.7	85 0.7	86 0.7
	32 0.0	33 0.0	85 0.7	86 0.7	87 0.7	86 0.7	87 0.7	88 0.7	89 0.7
	33 0.0	34 0.0	88 0.7	89 0.7	90 0.7	89 0.7	90 0.7	91 0.7	92 0.7
	34 0.0	35 0.0	90 0.7	91 0.7	92 0.7	91 0.7	92 0.7	93 0.7	94 0.7
	35 0.0	36 0.0	92 0.7	93 0.7	94 0.7	93 0.7	94 0.7	95 0.7	96 0.7
	36 0.0	37 0.0	94 0.7	95 0.7	96 0.7	95 0.7	96 0.7	97 0.7	98 0.7
	37 0.0	38 0.0	96 0.7	97 0.7	98 0.7	97 0.7	98 0.7	99 0.7	100 0.7
	38 0.0	39 0.0	99 0.7	100 0.7	101 0.7	100 0.7	101 0.7	102 0.7	103 0.7
	39 0.0	40 0.0	101 0.7	102 0.7	103 0.7	102 0.7	103 0.7	104 0.7	105 0.7
	40 0.0	41 0.0	104 0.7	105 0.7	106 0.7	105 0.7	106 0.7	107 0.7	108 0.7
	41 0.0	42 0.0	106 0.7	107 0.7	108 0.7	107 0.7	108 0.7	109 0.7	110 0.7
	42 0.0	43 0.0	109 0.7	110 0.7	111 0.7	110 0.7	111 0.7	112 0.7	113 0.7
	43 0.0	44 0.0	111 0.7	112 0.7	113 0.7	112 0.7	113 0.7	114 0.7	115 0.7
	44 0.0	45 0.0	114 0.7	115 0.7	116 0.7	115 0.7	116 0.7	117 0.7	118 0.7
	45 0.0	46 0.0	116 0.7	117 0.7	118 0.7	117 0.7	118 0.7	119 0.7	120 0.7
	46 0.0	47 0.0	119 0.7	120 0.7	121 0.7	120 0.7	121 0.7	122 0.7	123 0.7
	47 0.0	48 0.0	121 0.7	122 0.7	123 0.7	122 0.7	123 0.7	124 0.7	125 0.7
	48 0.0	49 0.0	124 0.7	125 0.7	126 0.7	125 0.7	126 0.7	127 0.7	128 0.7
	49 0.0	50 0.0	126 0.7	127 0.7	128 0.7	127 0.7	128 0.7	129 0.7	130 0.7
	50 0.0	51 0.0	129 0.7	130 0.7	131 0.7	130 0.7	131 0.7	132 0.7	133 0.7
	51 0.0	52 0.0	131 0.7	132 0.7	133 0.7	132 0.7	133 0.7	134 0.7	135 0.7
	52 0.0	53 0.0	134 0.7	135 0.7	136 0.7	135 0.7	136 0.7	137 0.7	138 0.7
	53 0.0	54 0.0	136 0.7	137 0.7	138 0.7	137 0.7	138 0.7	139 0.7	140 0.7
	54 0.0	55 0.0	139 0.7	140 0.7	141 0.7	140 0.7	141 0.7	142 0.7	143 0.7
	55 0.0	56 0.0	141 0.7	142 0.7	143 0.7	142 0.7	143 0.7	144 0.7	145 0.7
	56 0.0	57 0.0	144 0.7	145 0.7	146 0.7	145 0.7	146 0.7	147 0.7	148 0.7
	57 0.0	58 0.0	146 0.7	147 0.7	148 0.7	147 0.7	148 0.7	149 0.7	150 0.7
	58 0.0	59 0.0	149 0.7	150 0.7	151 0.7	150 0.7	151 0.7	152 0.7	153 0.7
	59 0.0	60 0.0	151 0.7	152 0.7	153 0.7	152 0.7	153 0.7	154 0.7	155 0.7
	60 0.0	61 0.0	154 0.7	155 0.7	156 0.7	155 0.7	156 0.7	157 0.7	158 0.7
	61 0.0	62 0.0	156 0.7	157 0.7	158 0.7	157 0.7	158 0.7	159 0.7	160 0.7
	62 0.0	63 0.0	159 0.7	160 0.7	161 0.7	160 0.7	161 0.7	162 0.7	163 0.7
	63 0.0	64 0.0	161 0.7	162 0.7	163 0.7	162 0.7	163 0.7	164 0.7	165 0.7
	64 0.0	65 0.0	164 0.7	165 0.7	166 0.7	165 0.7	166 0.7	167 0.7	168 0.7
	65 0.0	66 0.0	166 0.7	167 0.7	168 0.7	167 0.7	168 0.7	169 0.7	170 0.7
	66 0.0	67 0.0	169 0.7	170 0.7	171 0.7	170 0.7	171 0.7	172 0.7	173 0.7
	67 0.0	68 0.0	172 0.7	173 0.7	174 0.7	173 0.7	174 0.7	175 0.7	176 0.7

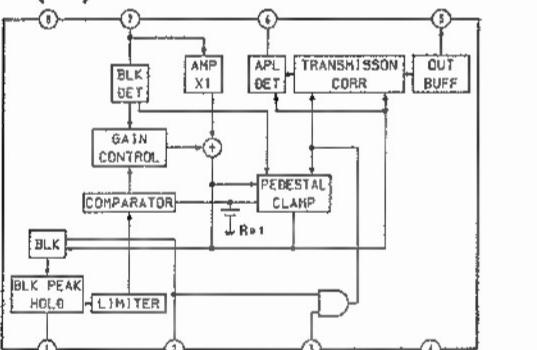
B (3/4) BOARD : IC408 TDA4760



B (3/4) BOARD : IC413 NJM2234M

B (3/4) BOARD :  
IC414 MC7HC4053F-T2

B (3/4) BOARD : IC601 CX20125



B (3/4) BOARD \* MARK LIST

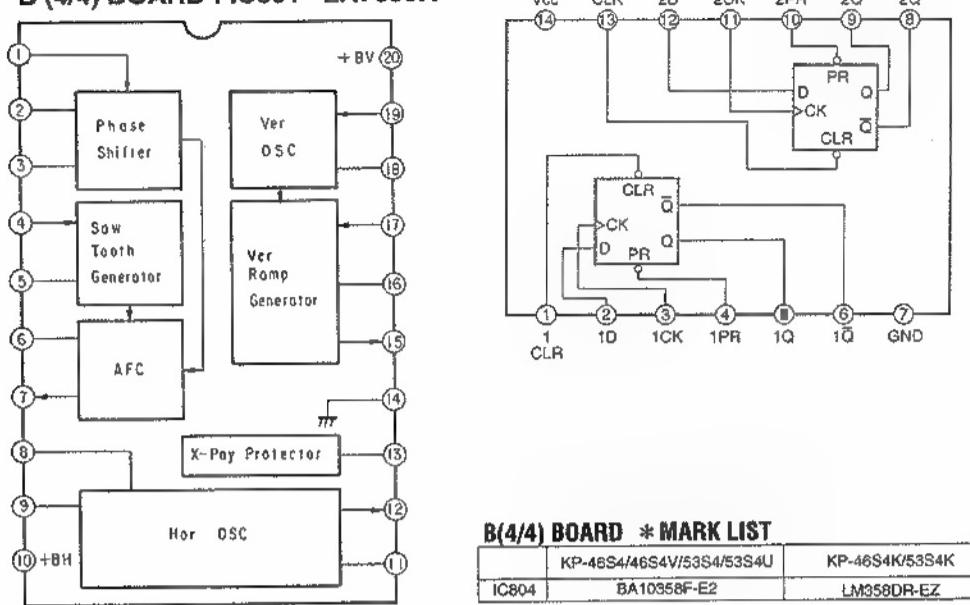
KP-46S4/46S4V/33S4/53S4U	KP-46S4K/53S4K
CXPS460-0270	CXP85460-047Q
IC405 TPU3040-TC20	TPU3040TC-22-TP
IC411 BA10393F-E2	LM599PS-E20
IC415 BA10358F-E2	LM598F-E2

B(3/4) BOARD IC VOLTAGE LIST

Pin	Voltages	Pin	Voltages	Pin	Voltages
1	GND	5	0.2	15	2.5
2	GND	6	0	16	2.5
3	GND	7	0.2	17	-
4	GND	8	0.2	18	-
5	5.0	9	4.7	19	4.4
6	-	10	4.0	20	4.4
7	GND	11	5.0	21	-
8	-	12	5.0	22	2.1
9	-	13	5.0	23	9.7
10	-	14	5.0	24	30.2
11	2.4	15	4.6	25	0
12	4.7	16	4.6	26	0
13	4.7	17	4.8	27	0
14	-	18	0	28	0
15	-	19	0	29	0.7
16	-	20	0	30	2.3
17	-	21	0	31	-
18	-	22	0	32	-
19	-	23	0	33	-
20	-	24	0	34	0.7
21	-	25	0	35	0
22	-	26	0	36	-
23	-	27	0	37	0
24	-	28	0	38	0
25	-	29	0	39	0
26	-	30	0	40	4.9
27	-	31	0	41	2.5
28	-	32	0	42	0.4
29	-	33	0	43	0
30	-	34	0	44	4.4
31	-	35	0	45	0.6
32	-	36	0	46	0.2
33	-	37	0	47	0
34	-	38	0	48	0
35	-	39	0	49	0
36	-	40	0	50	0
37	-	41	0	51	0
38	-	42	0	52	0
39	-	43	0	53	0
40	-	44	0	54	0
41	-	45	0	55	0
42	-	46	0	56	0
43	-	47	0	57	0
44	-	48	0	58	0
45	-	49	0	59	0
46	-	50	0	60	0
47	-	51	0	61	0
48	-	52	0	62	0
49	-	53	0	63	0
50	-	54	0	64	0
51	-	55	0	65	0
52	-	56	0	66	0
53	-	57	0	67	0
54	-	58	0	68	0
55	-	59	0	69	0
56	-	60	0	70	0
57	-	61	0	71	0
58	-	62	0	72	0
59	-	63	0	73	0
60	-	64	0	74	0
61	-	65	0	75	0
62	-	66	0	76	0
63	-	67	0	77	0
64	-	68	0	78	0
65	-	69	0	79	0
66	-	70	0	80	0
67	-	71	0	81	0
68	-	72	0	82	0
69	-	73	0	83	0
70	-	74	0	84	0
71	-	75	0	85	0
72	-	76	0	86	0
73	-	77	0	87	0
74	-	78	0	88	0
75	-	79	0	89	0
76	-	80	0	90	0
77	-	81	0	91	0
78	-	82	0	92	0
79	-	83	0	93	0
80	-	84	0	94	0
81	-	85	0	95	0
82	-	86	0	96	0
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84	-	88	0	98	0
85	-	89	0	99	0
86	-	90	0	100	0
87	-	91	0	101	0
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115	-	119	0	129	0
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117	-	121	0	131	0
118	-	122	0	132	0
119	-	123	0	133	0
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121	-	125	0	135	0
122	-	126	0	136	0
123	-	127	0	137	0
124	-	128	0	138	0
125	-	129	0	139	0
126	-	130	0	140	0
127	-	131	0	141	0
128	-	132	0	142	0
129	-	133	0	143	0
130	-	134	0	144	0
131	-	135	0	145	0
132	-	136	0	146	0
133	-	137	0	147	0
134	-	138	0	148	0
135	-	139	0	149	0
136	-	140	0	150	0
137	-	141	0	151	0
138	-	142	0	152	0
139	-	143	0	153	0
140	-	144	0	154	0
141	-	145	0	155	0
142	-	146	0	156	0
143	-	147	0	157	0
144	-	148	0	158	0
145	-	149	0	159	0
146	-	150	0	160	0
147	-	151	0	161	0
148	-	152	0	162	0
149	-	153			

NOTE:  
 • : Pattern from the side which enables seeing.  
 • : Pattern of the rear side.

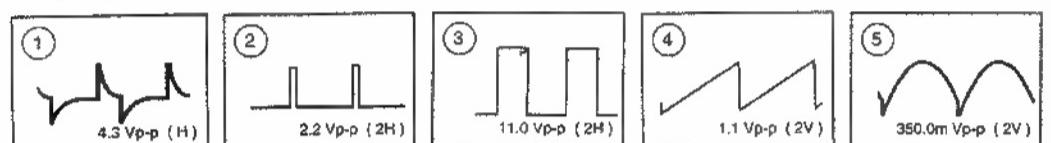
B (4/4) BOARD : IC801 LA7856A



B(4/4) BOARD \* MARK LIST

KP-46S4/46S4V/53S4/53S4K  
IC804 BA1035BF-E2 LM598DR-EZ

\* B (4/4) BOARD WAVEFORMS

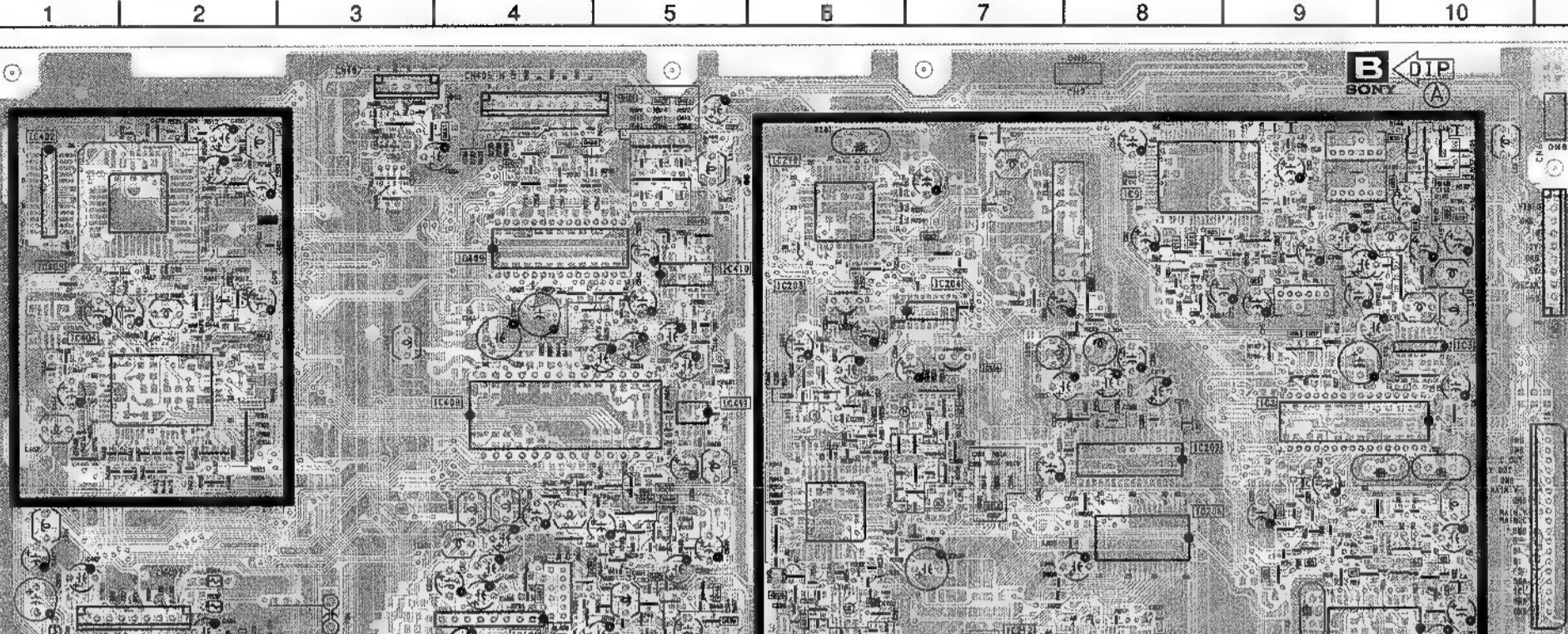


B BOARD

DIO/D	*	D803	G-4	(9)	IC413	Q-3	Q35	B-10	(9)	Q458	L-5	(9)
D1	C-10	(1)	IC414	E-5			Q36	C-9	(9)	Q459	K-5	(9)
D2	N-9	(2)	IC415	E-2			Q37	C-8	(9)	Q460	D-4	(9)
D3	N-9	(3)	IC801	L-4D-4			Q38	E-3	(9)	Q461	A-4	(9)
D4	D-9	(4)	IC801	I-5G-5			Q39	D-5	(9)	Q462	E-5	(9)
D5	K-10	(5)	IC802	F-5			Q40	L-8	(9)	Q463	O-4	(9)
D201	J-7	(6)	IC804	F-6			Q41	M-9	(9)	Q464	D-5	(9)
D202	C-6	(7)	IC805	F-4			Q42	A-3	(9)	Q465	E-5	(9)
D203	N-6	(8)	IC806	F-4			Q43	F-4	(9)	Q466	D-5	(9)
D204	M-7	(9)	IC807	F-10			Q44	G-1	(9)	Q467	D-4	(9)
D205	M-6	(10)	IC808	J-9F-9			Q45	H-1	(9)	Q468	A-4	(9)
D206	L-6	(11)	IC9	B-8			Q46	I-9	(9)	Q469	A-4	(9)
D208	C-7	(12)	IC10	O-10			Q47	M-5	(9)	Q470	A-4	(9)
D209	C-7	(13)	IC201	D-6			Q48	D-6	(9)	Q471	E-1	(9)
D210	C-7	(14)	IC202	C-8			Q49	N-5	(9)	Q472	M-1	(9)
D211	D-6	(15)	IC203	N-8B-8			Q50	N-9	(9)	Q473	E-2	(9)
D213	D-6	(16)	IC204	B-7			Q51	N-8	(9)	Q474	E-2	(9)
D214	F-7	(17)	IC206	D-8			Q52	D-6	(9)	Q475	L-4	(9)
D402	B-1	(18)	IC207	D-9			Q53	D-6	(9)	Q476	E-1	(9)
D403	N-2	(19)	IC210	B-6			Q54	F-6	(9)	Q477	E-1	(9)
D404	F-2	(20)	IC212	B-8			Q55	C-7	(9)	Q478	G-3	(9)
D405	N-4	(21)	IC213	E-5K-6			Q56	D-6	(9)	Q479	D-5	(9)
D406	N-4	(22)	IC214	N-7C-7			Q57	F-6	(9)	Q480	D-5	(9)
D407	O-5	(23)	IC215	M-7			Q58	M-5	(9)	Q481	D-3	(9)
D408	O-5	(24)	IC216	L-6			Q59	B-10	(9)	Q482	D-5	(9)
D410	B-5	(25)	IC217	M-7			Q60	K-6	(9)	Q483	M-5	(9)
D411	B-5	(26)	IC218	F-8			Q61	K-9	(9)	Q484	M-5	(9)
D412	B-5	(27)	IC219	L-8			Q62	N-9	(9)	Q485	O-10	(9)
D414	N-5	(28)	IC221	J-7F-7			Q63	N-10	(9)	Q486	K-10	(9)
D415	M-5	(29)	IC222	L-6			Q64	I-1	(9)	Q487	I-1	(9)
D416	D-2	(30)	IC401	N-1			Q65	B-8	(9)	Q488	D-5	(9)
D417	D-6	(31)	IC402	B-1			Q66	K-10	(9)	Q489	J-6	(9)
D418	D-6	(32)	IC403	F-2			Q67	K-10	(9)	Q490	J-6	(9)
D419	L-5	(33)	IC404	C-2			Q68	B-8	(9)	Q491	M-5	(9)
D420	L-5	(34)	IC405	B-2			Q69	O-10	(9)	Q492	M-5	(9)
D421	K-5	(35)	IC406	N-2			Q70	N-10	(9)	Q493	M-5	(9)
D422	B-5	(36)	IC407	D-1			Q71	K-10	(9)	Q494	G-3	(9)
D424	E-2	(37)	IC408	M-4C-4			Q72	O-10	(9)	Q495	K-5	(9)
D425	N-4	(38)	IC409	N-4B-4			Q73	N-10	(9)	Q496	C-5	(9)
D426	B-3	(39)	IC410	B-5			Q74	A-10	(9)	Q497	O-5	(9)
D427	C-5	(40)	IC411	C-5			Q75	A-10	(9)	Q498	I-2	(9)
D428	G-6	(41)	IC412	E-5			Q76	O-10	(9)	Q499	E-5	(9)

B TWIN-PICTURE, FLICKER-FREE,  
 μCOM, OSD, TEXT, NICAM,  
 CHROMA DECODER

- B BOARD -



B(4/4) BOARD  
 IC VOLTAGE LIST

Pin	Voltages	Pin	Voltages
IC801	1 7.3	4	GND
	2 7.3	5	2.3
	3 7.8	6	GND
	4 0.4	7	2.3
	5 3.7	8	2.6
	6 2.9	9	5.0
	7 6.4	10	5.0
	8 5.9	11	2.3
	9 5.5	12	2.3
	10 11.3	13	1.7
	11 5.7	14	1.4
	12 4.5	15	GND
	13 GND	16	2.5
	14 GND	17	GND
	15 GND	18	2.6
	16 GND	19	0.6
	17 GND	20	0
	18 GND	21	0
	19 GND	22	0
	20 GND	23	0
	21 0.9	24	5.0
	22 2.5	25	5.0
	23 3.4	26	4.4
	24 4.0	27	4.8
	25 2.5	28	GND
	26 GND	29	5.0
	27 GND	30	4.3
	28 GND	31	5.0
	29 GND	32	5.0
	30 GND	33	5.0
	31 0.6	34	-
	32 0.6	35	5.0
	33 0.4	36	2.8
	34 0	37	-
	35 0	38	GND
	36 2.8	39	-
	37 1.5	40	-
	38 GND	41	5.0
	39 GND	42	-
	40 GND	43	GND
	41 1.8	44	1.5
	42 1.8	45	GND
	43 GND	46	GND
	44 1.5	47	1.8
	45 1.5	48	1.8
	46 GND	49	-
	47 1.8	50	-
	48 1.8	51	-
	49 GND	52	-
	50 GND	53	-
	51 GND	54	-
	52 GND	55	-
	53 GND	56	-
	54 GND	57	-
	55 GND	58	-
	56 GND	59	-
	57 GND	60	-
	58 GND	61	-
	All voltages are in V.		
	- Blank Pin		

8

C

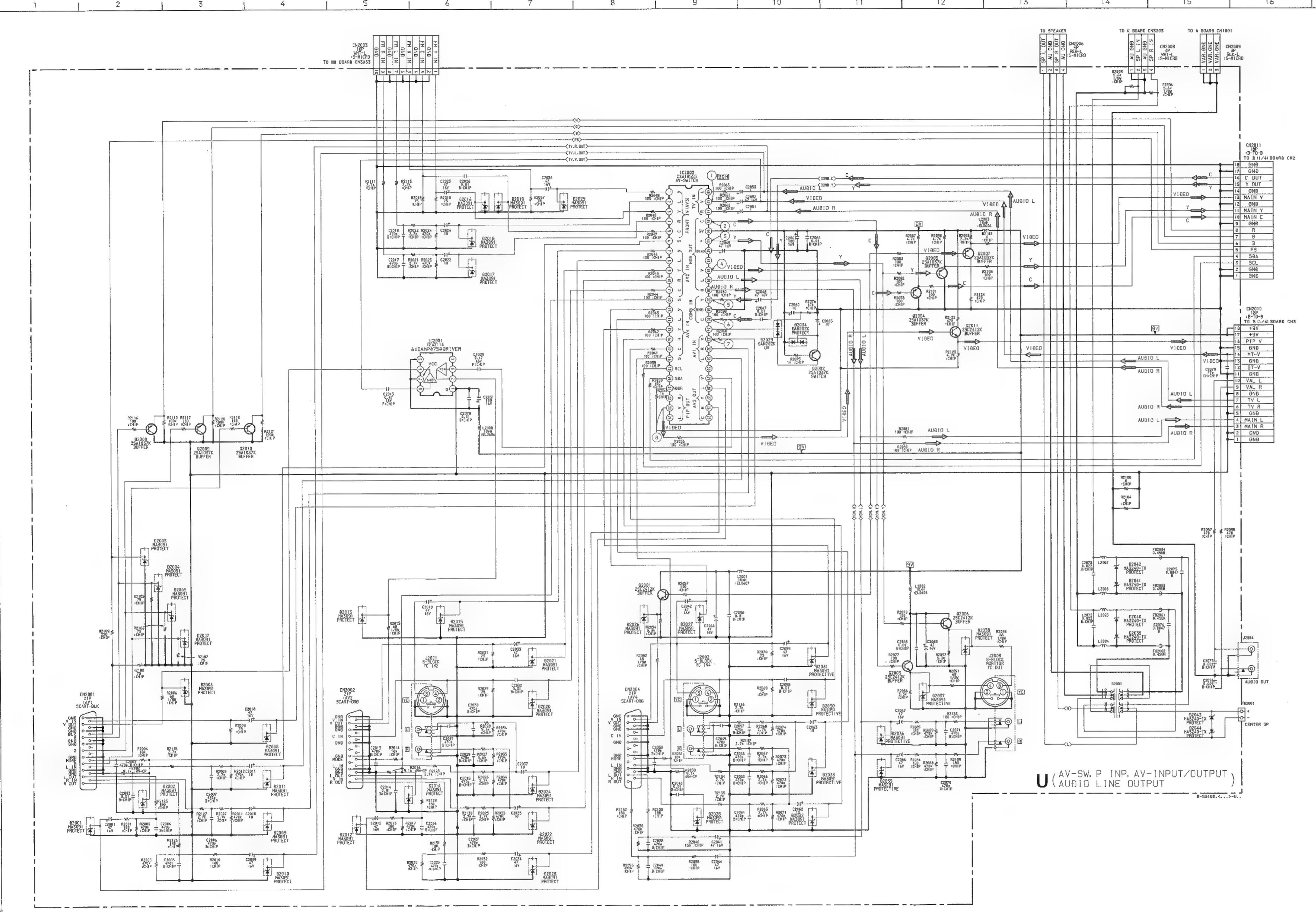
E

8	C	E
Q801	0.1	6.9
Q803	12.0	0
Q804	4.5	11.3
Q805	6.9	GND
Q806	4.9	3.4
	4.8	

All voltages are in V.

</div

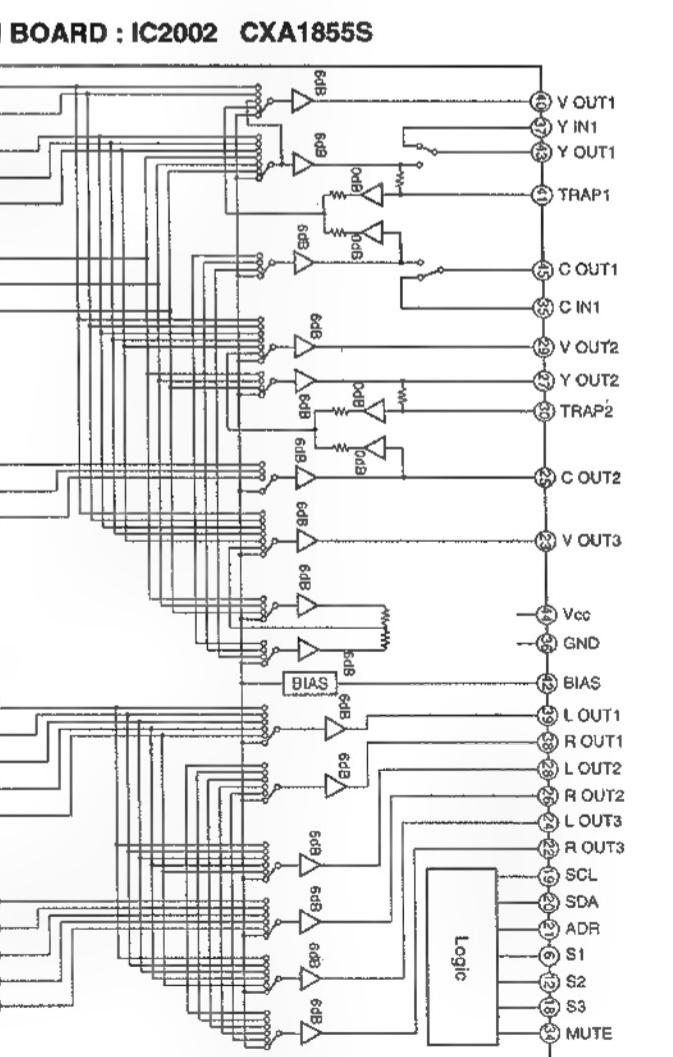
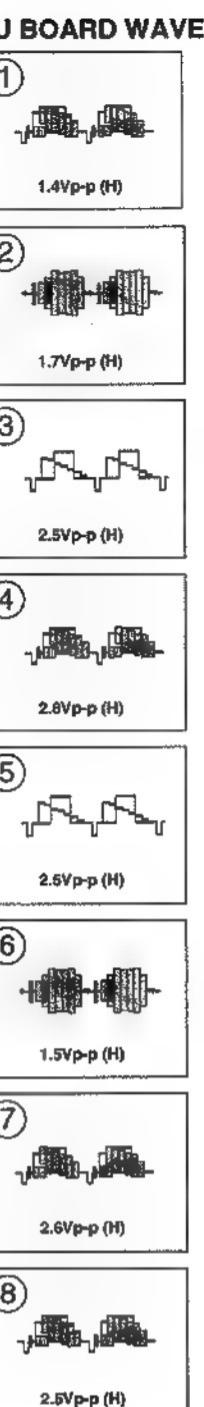




U BOARD IC VOLTAGE LIST	
Pin	Voltages
IC2001	1 GND 2 2.0 3 2.7 4 8.8 6 1.8 7 8.8 8 2.2
IC2002	1 4.5 2 4.5 3 4.5 4 4.5 5 4.5 6 0 7 4.5 8 4.5 9 4.5 10 4.5 11 4.5 12 4.5 13 4.5 14 4.5 15 4.5 16 4.5 17 4.5 18 0 19 4.8 20 4.8 21 0 22 - 23 4.5 24 - 25 - 26 4.5 27 - 28 4.5 29 - 30 4.5 31 4.5 32 4.5 33 4.5 34 0.5 35 4.5 36 4.5 37 4.5 38 4.5 39 4.5 40 4.5 41 - 42 4.5 43 4.5 44 8.8 45 8.8 46 8.8 47 8.8 48 8.8
All voltages are in V. - Blank Pin	

U BOARD TRANSISTOR VOLTAGE LIST	
B	E
Q2001	4.4 0.9 3.6
Q2002	4.5 1.2 8.6
Q2003	4.5 8.9 3.9
Q2004	4.5 GND 5.1
Q2005	4.5 GND 5.1
Q2006	4.4 8.8 3.8
Q2007	4.4 0.8 5.0
Q2008	0 GND 0
Q2009	0 GND 0
Q2010	0 GND 0
Q2011	0 3.8 0

All voltages are in V.



	B	C	E
Q5001	0	5.7	GND
Q5002	-3.2	-5.0	-2.6
Q5003	2.5	5.1	1.0
Q5004	0	5.0	GND
Q5101	0	2.5	GND
Q5102	0	3.3	GND
Q5401	0	4.8	GND
Q5411	0	5.7	GND

All voltages are in V.

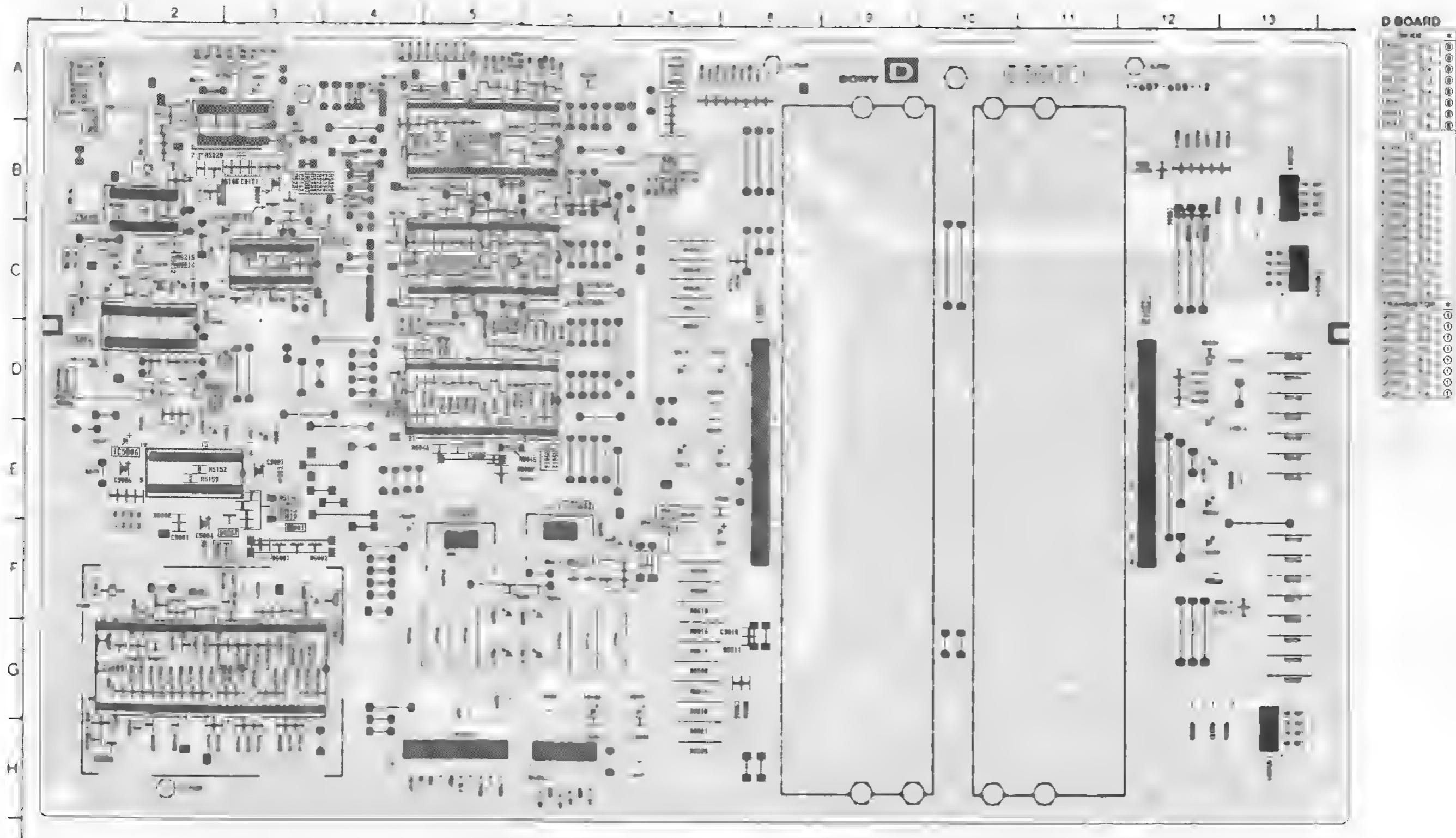
## BOARD IC VOLTAGE LIST

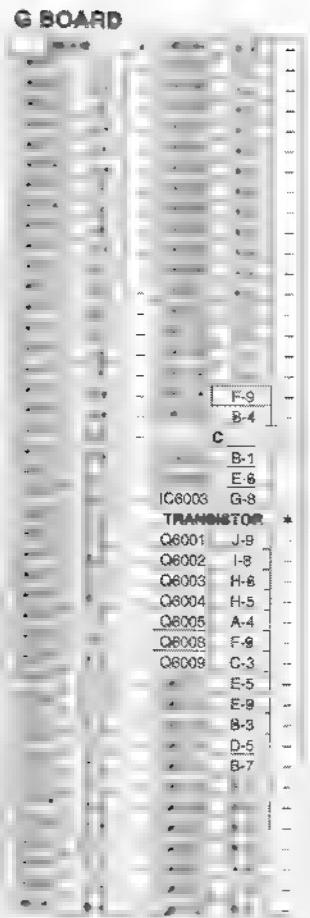
	Pn	Voltaged
IC5001	1	5.1
	2	0
	3	5.0
	4	0
	5	26
	6	0
	7	26
	8	0
	9	25
	10	0
	11	14
	12	0
	13	14
	14	22
	15	22
	16	5.0
	17	0
	18	2.1
	19	0
	20	1.0
	21	0.8
	22	1.1
	23	0
	24	0
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**D**

[HV SUB DEFLECTION]

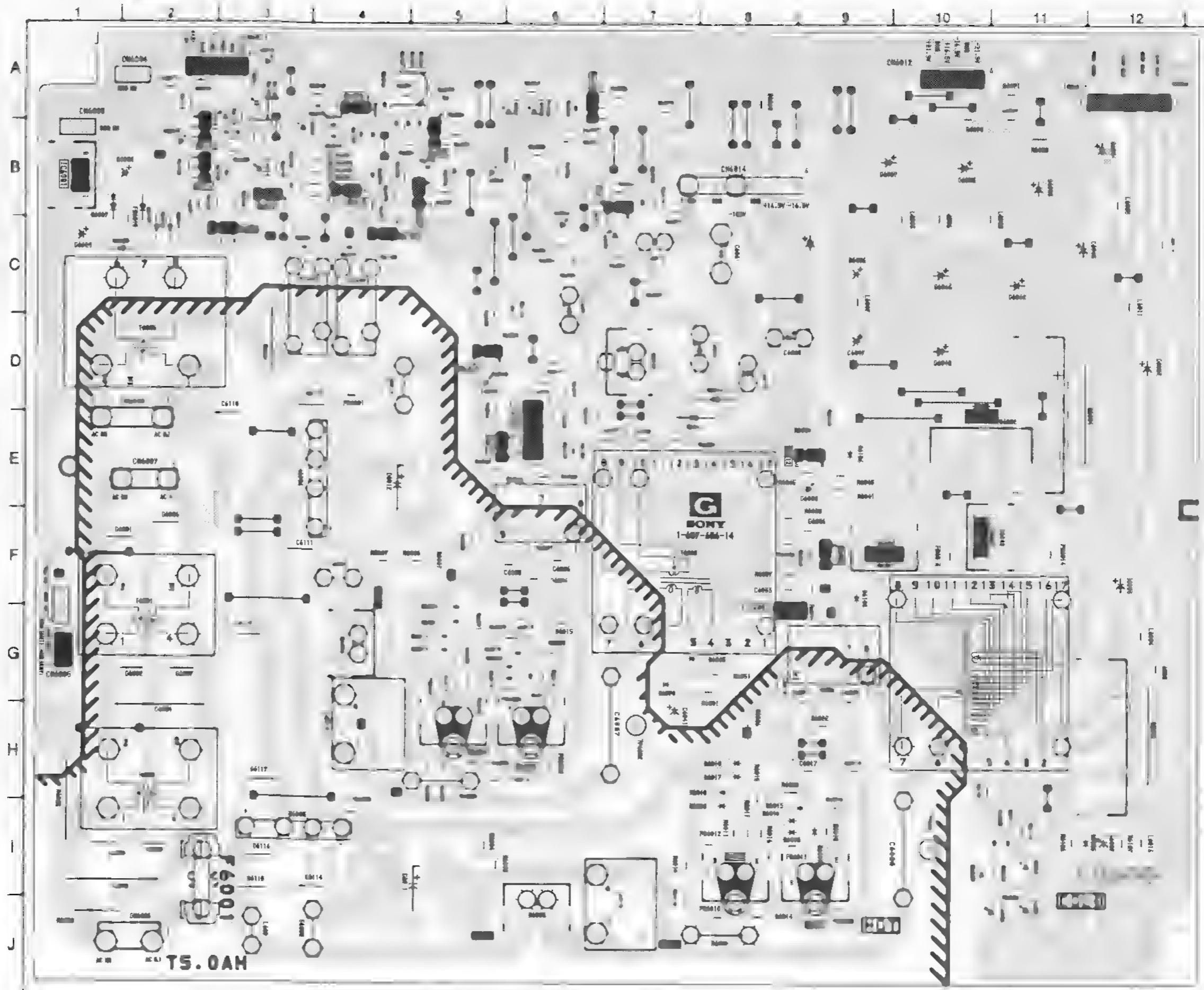
- D BOARD -

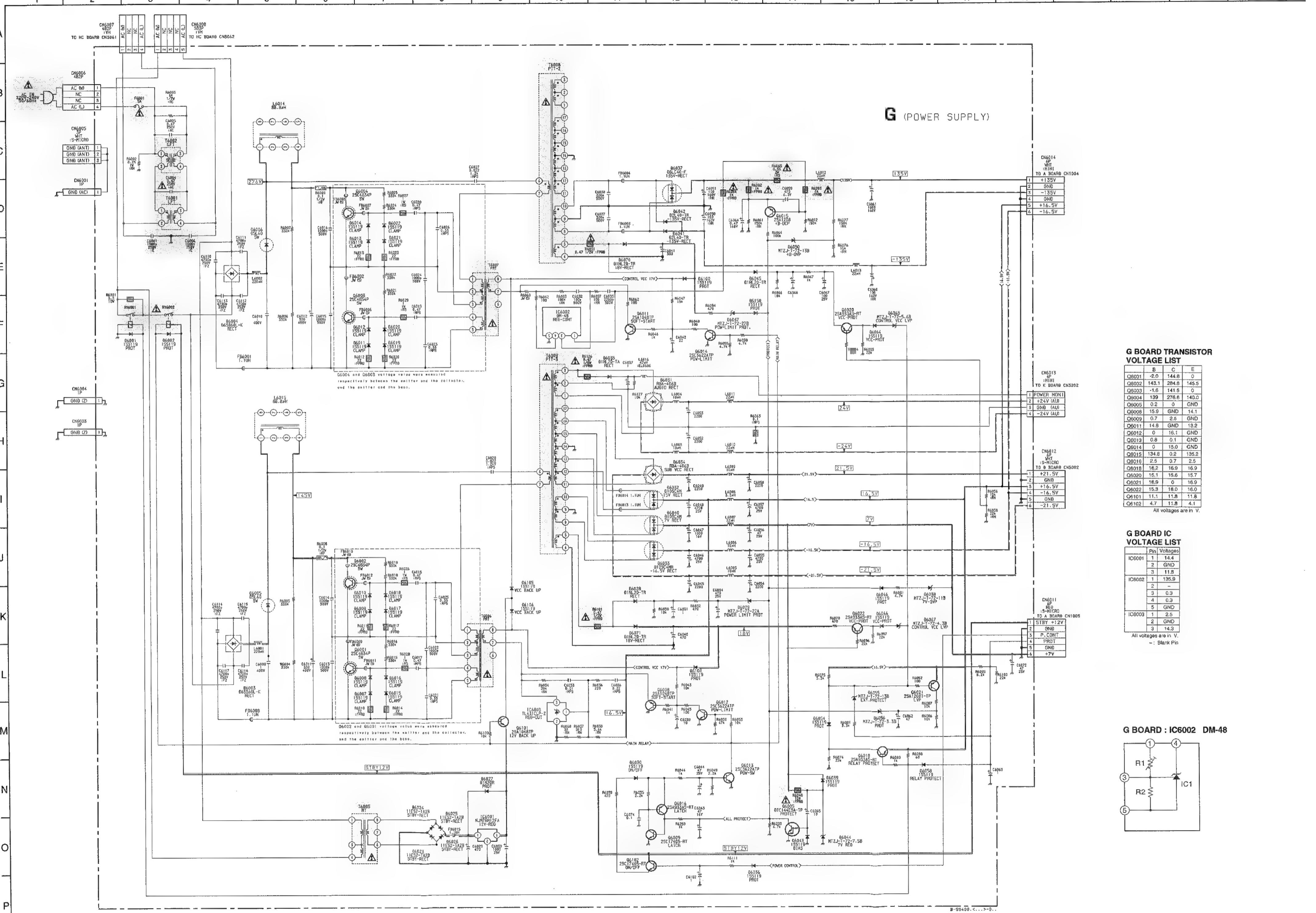




- Q BOARD -

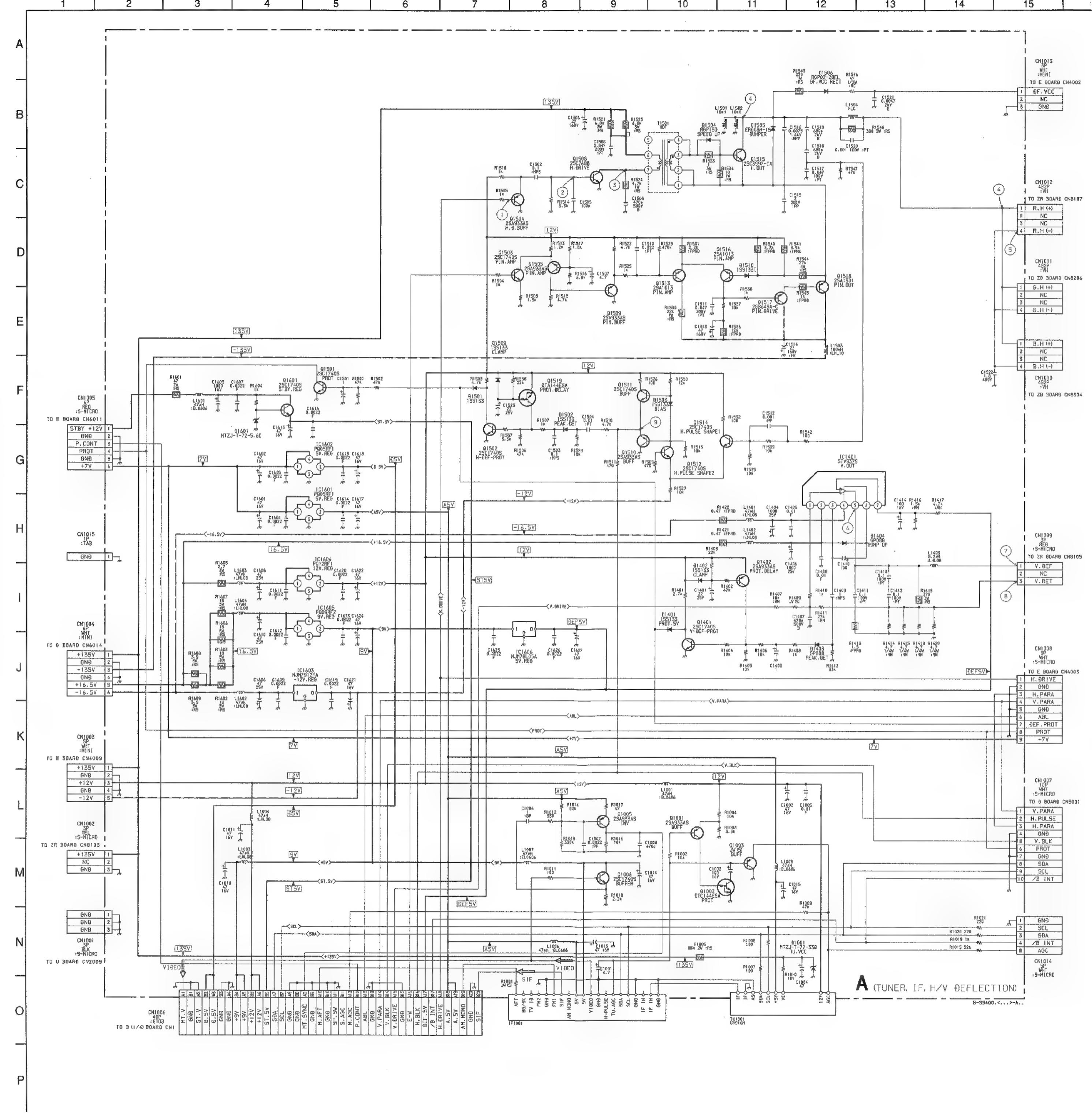
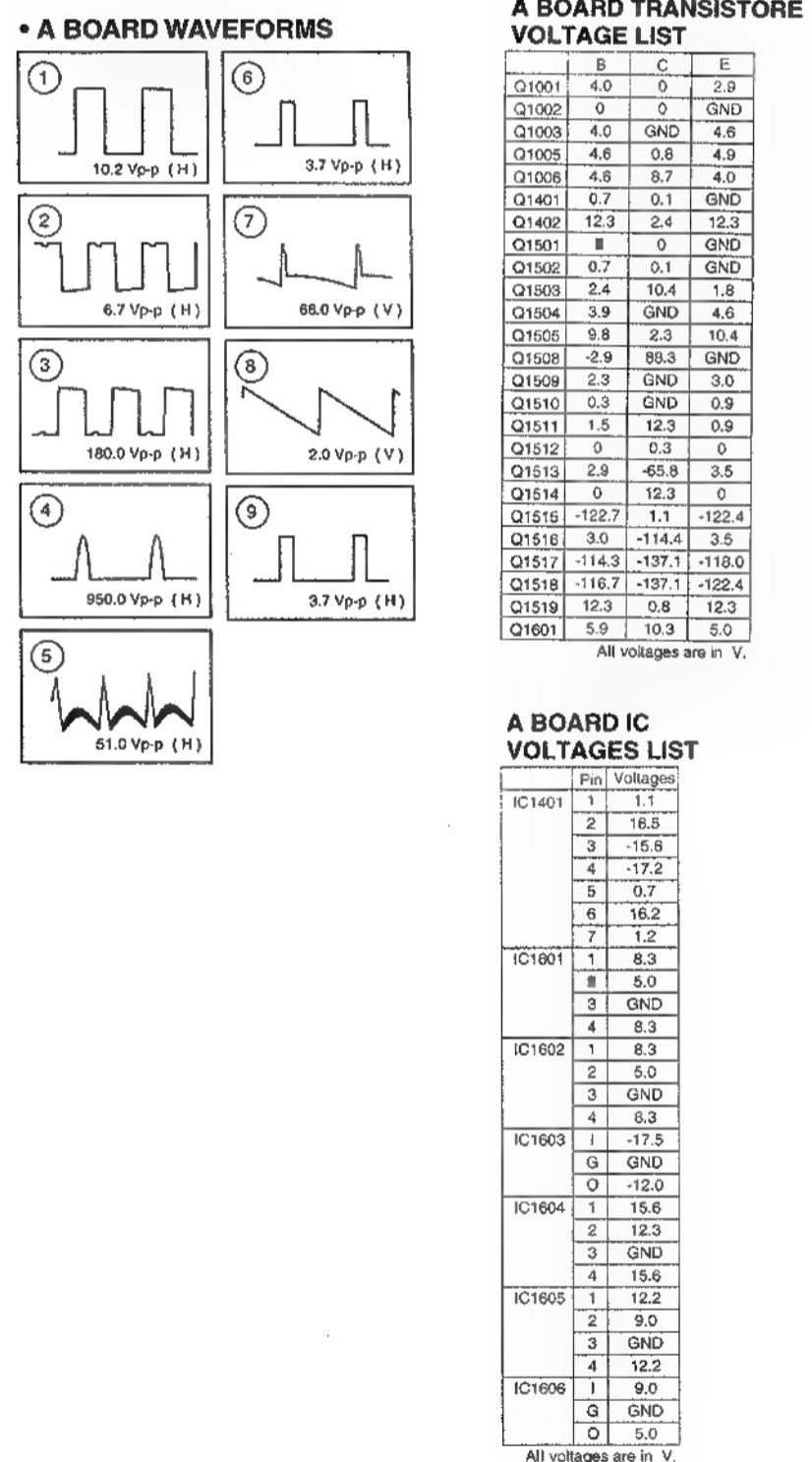
[POWER SUPPLY] 4





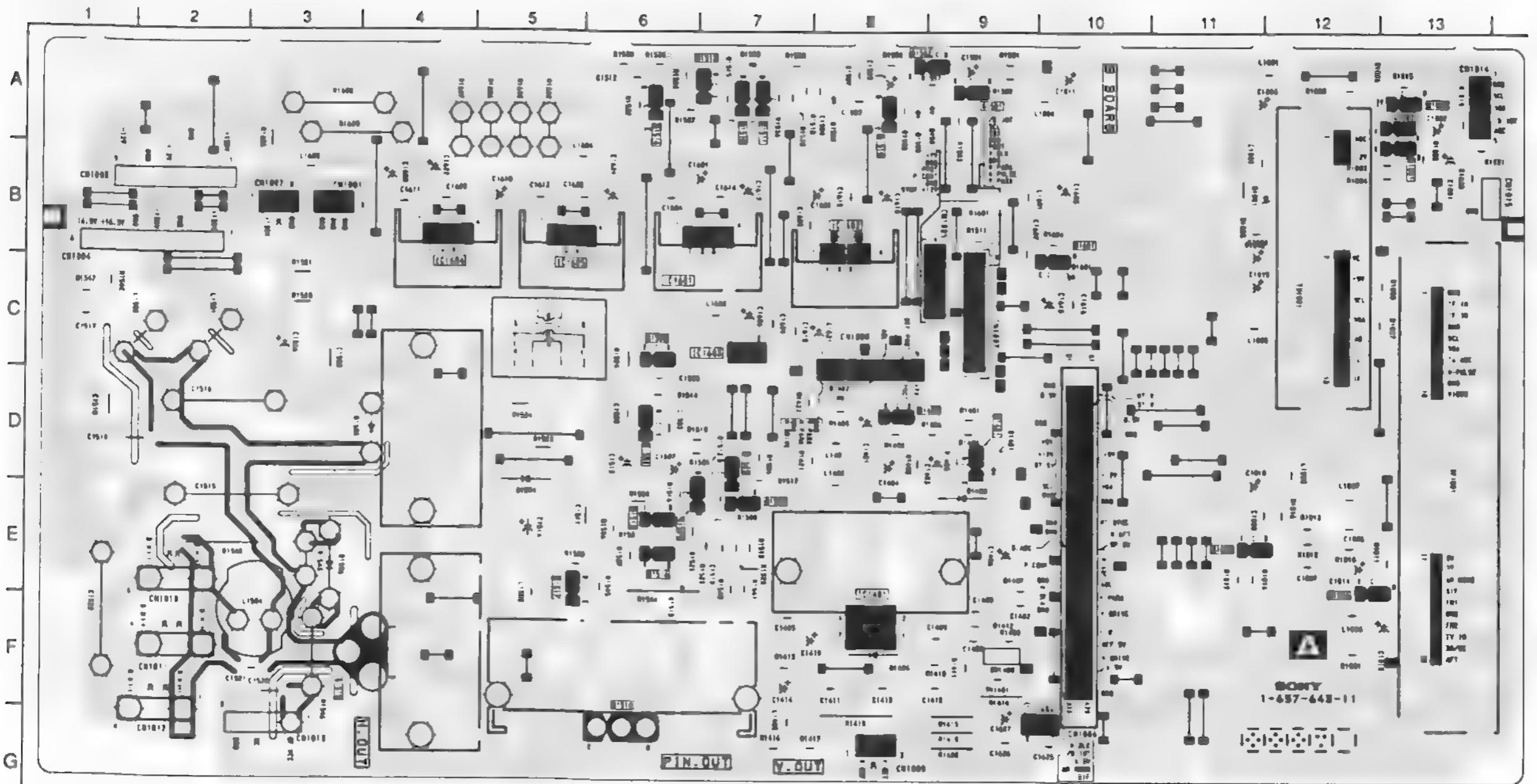
## Schematic diagrams

← G board A board →



A TUNER, IF,  
H/V DEFLECTION

- A BOARD -



A BOARD

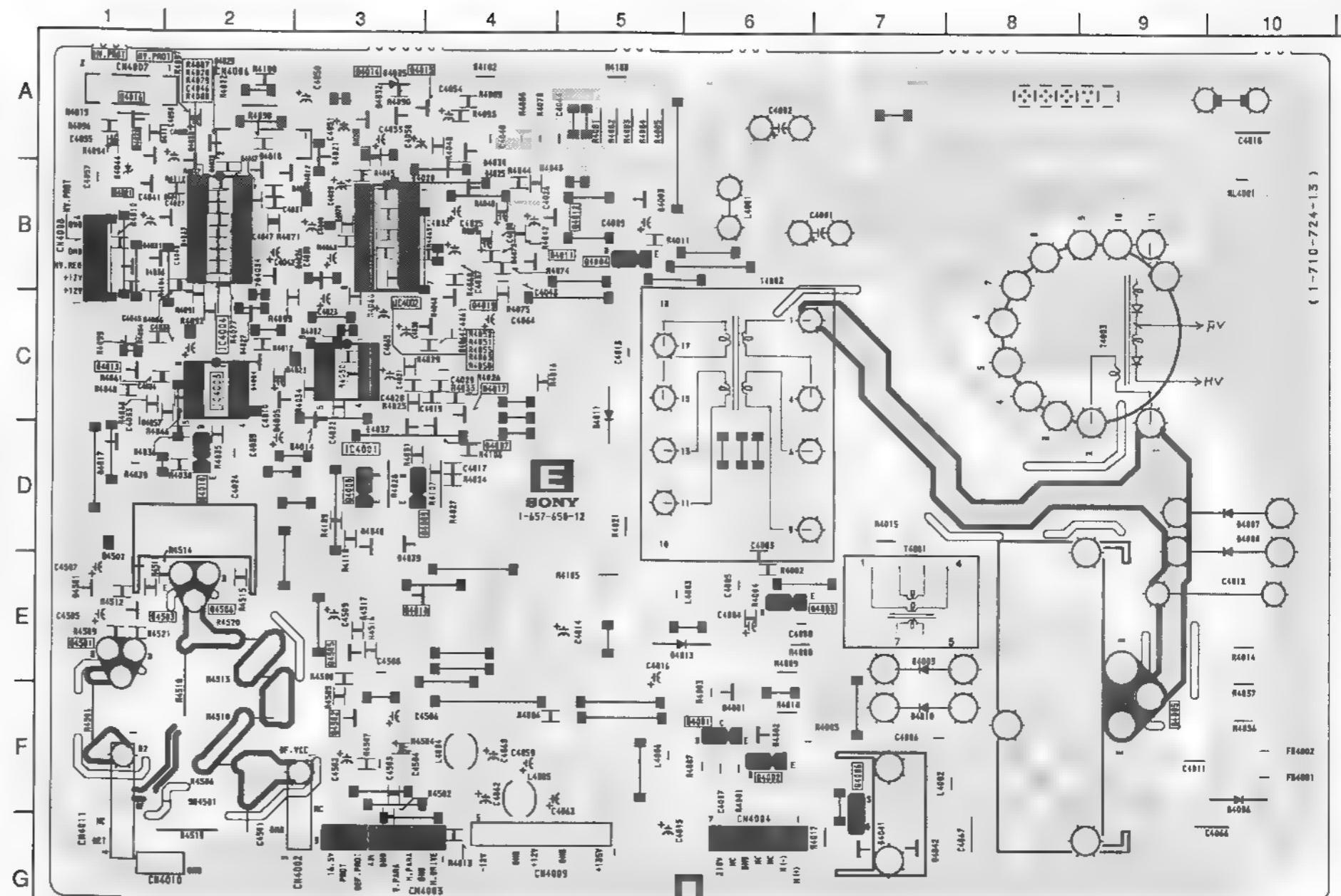
DIODE	
D1x	R12
D1y	D9
D1z	L8
D1A	E9
D1B	F9
D1C	A9
D1D	C9
D1E	A7
D1F	I5
D1G	D4
D1H	E1
D1I	A8
D1J	L5
D1K	C-10
IC	
IC1A1	F8
IC1A2	B7
IC1A3	B8
IC1A4	C7
IC1A5	B4
IC1A6	B5
IC1A7	C6
TRANSISTOR	
Q1A	A13
Q1B	A13
Q1C	A13
Q1D	I1
Q1E	E1
Q1F	D9
Q1G	D8
Q1H	A9
Q1I	E7
Q1J	D4
Q1K	D7
Q1L	C9
Q1M	E4
Q1N	A7
Q1O	A7
Q1P	A7
Q1Q	E6
Q1R	A6
Q1S	E6
Q1T	E5
Q1U	E6
Q1V	A6
Q1W	C-10

**E** [HV-REGULATOR,  
DYNAMIC FOCUS]

- E BOARD -

**E BOARD**

DIODE	*	D4043	C-4	④
D4001	F-6	④ D4044	B-1	-
D4002	F-6	④ D4501	E-1	②
D4003	B-5	④ D4502	E-1	②
D4004	C-2			
D4005	C-2	④ IC4001	C-3	
D4006	F-10	- IC4002	B-3	
D4007	D-10	- IC4003	C-2	
D4008	D-10	- IC4004	B-2	
D4009	F-7			
D4010	F-7	- Q4001	F-6	-
D4011	C-5	④ Q4002	F-6	
D4012	B-2	④ Q4003	E-6	-
D4013	E-5	④ Q4004	B-5	-
D4014	C-3	④ Q4005	F-9	-
D4017	D-1	④ Q4006	F-7	-
D4018	B-2	④ Q4007	D-4	①
D4020	B-4	④ Q4008	D-3	-
D4021	A-3	④ Q4009	D-3	-
D4023	B-2	④ Q4010	D-2	-
D4025	B-4	④ Q4011	B-4	①
D4026	B-3	④ Q4012	B-4	①
D4027	C-2	④ Q4013	C-1	
D4028	A-2	④ Q4014	A-2	①
D4029	A-2	④ Q4015	A-4	①
D4030	A-4	④ Q4016	A-1	①
D4031	B-1	④ Q4017	C-4	①
D4032	A-3	④ Q4018	E-3	①
D4033	B-2	④ Q4019	C-4	①
D4034	B-2	④ Q4020	A-1	①
D4035	A-3	- Q4021	B-1	①
D4036	B-1	④ Q4501	E-1	-
D4037	D-3	④ Q4502	F-3	①
D4039	D-3	④ Q4503	E-1	①
D4040	D-3	④ Q4505	E-3	①
D4041	G-7	④ Q4506	E-2	-
D4042	G-7	④		

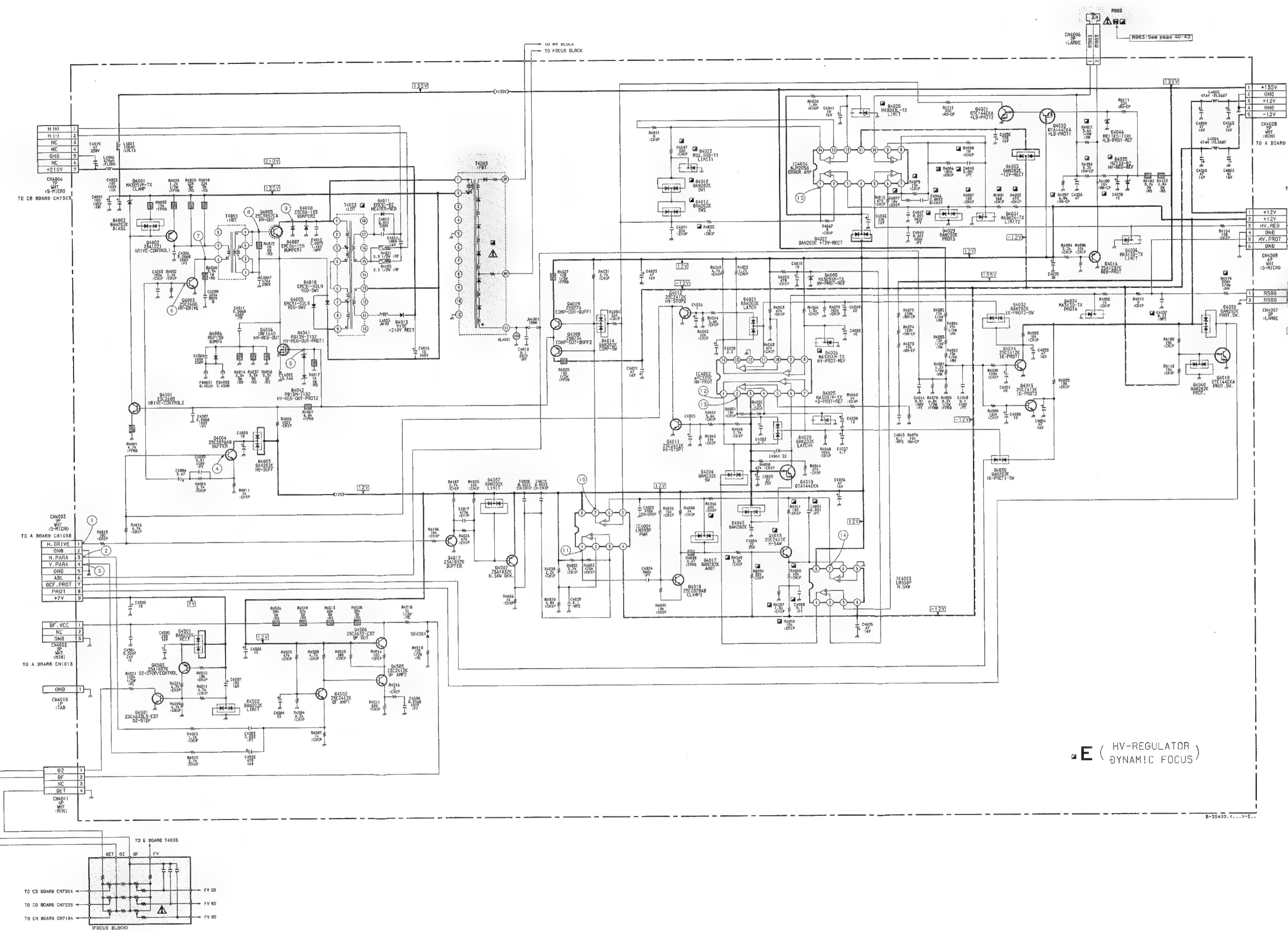


**NOTE:**

The circuit indicated as left contains high voltage of over 600 Vp-p. Care must be paid to prevent an electric shock in inspection or repairing.

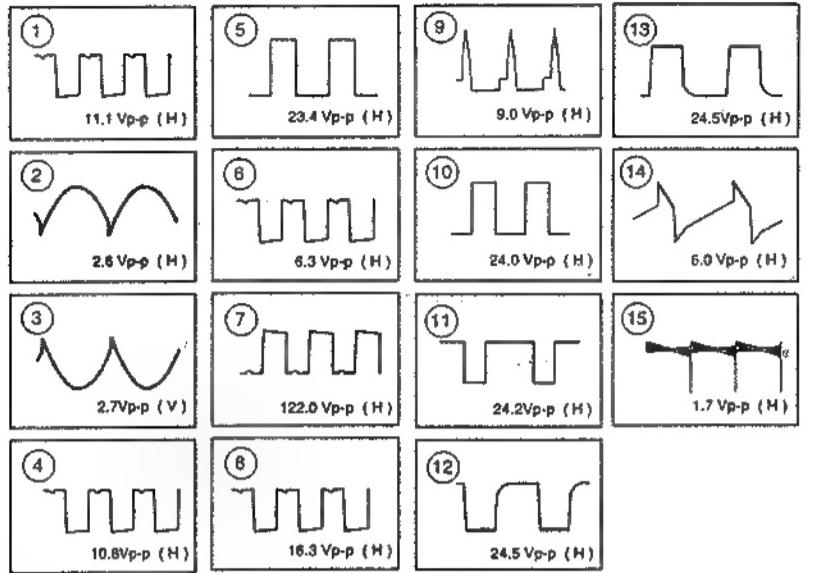


A



E ( HV-REGULATOR )  
DYNAMIC FOCUS

- E BOARD WAVEFORMS

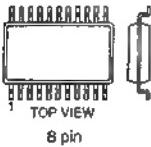
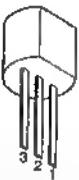
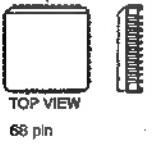
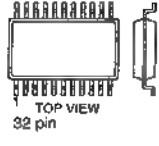
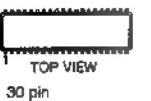
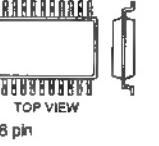
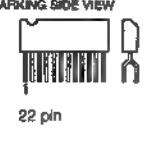
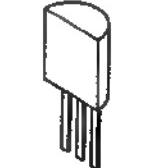
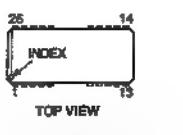
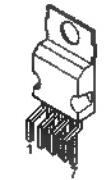
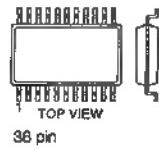
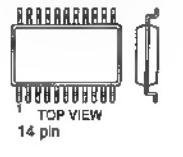
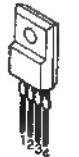
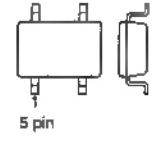
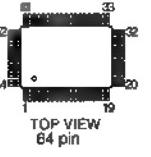
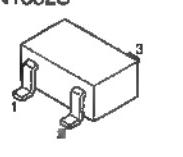
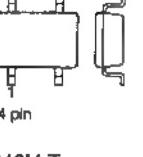
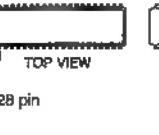
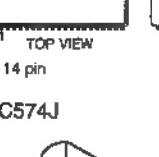
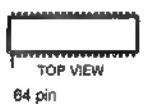
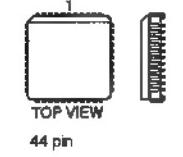
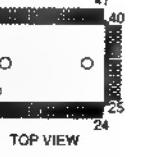
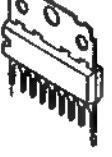
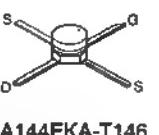
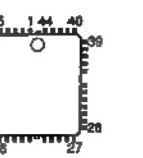
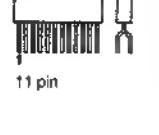
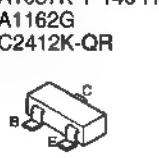
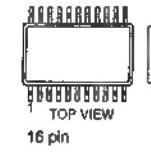


BOARD ID  
VOLTAGE LIST

	Pin	Voltages
C4001	1	3.1
	2	7.3
	3	8.7
	4	-12.0
	5	1.3
	6	2.1
	7	1.4
	8	12.3
C4002	1	0
	2	0
	3	12.3
	4	6.1
	5	4.7
	6	6.1
	7	0
	8	5.1
	9	4.8
	10	6.2
	11	0
	12	GND
	13	0.2
	14	0
C4003	1	0
	2	0
	3	GND
	4	-12.0
	5	GND
	6	0.6
	7	1.6
	8	12.3
C4004	1	1.4
	2	1.4
	3	1.4
	4	11.6
	5	7.7
	6	7.7
	7	7.7
	8	1.4
	9	7.6
	10	7.6
	11	-11.3
	12	3.3
	13	3.3
	14	3.3



## 6-5. SEMICONDUCTORS

BA10358F BA10393F LM358D LM393PS NJM2234M NJM2235M NJM2240M TDA2822D	HEF4046BT-T MC14046BDWR2 MC14053BCP MC74HC163AF MC74HC4053F TC74HC123AP TDA4665T-T $\mu$ PD4053BC	L78L05ACZ LM78L05ACZ	SAA7158WP-T	TDA8755T-T
 TOP VIEW 8 pin	 TOP VIEW 16 pin	 TOP VIEW 3 pin	 TOP VIEW 68 pin	 TOP VIEW 32 pin
CXA1817S	LA7856A PA0053B TDA2579B	NJM78M12FA NJM7805FA PQ09RF2 TA7812S	SDA9187-2XGEG SDA9188-3XPGE	TDA9141-N2C TDA9160A
 TOP VIEW 30 pin	 TOP VIEW 18 pin		 TOP VIEW 28 pin	 TOP VIEW 32 pin
CXA1855S	LM358P LM393P NJM2058D ST24C16CM1-TR/A TEA2114 $\mu$ PC358C $\mu$ PC393C	NJM7905FA NJM7912FA	STK392-040	TL431CLP
 TOP VIEW 48 pin	 TOP VIEW 8 pin		 MARKING SIDE VIEW 22 pin	 TOP VIEW
CXD2018Q	MB81C1000A-70PJ-T5	PM0002B	STV9379	TMS4C2970-28DT
 TOP VIEW 48 pin	 INDEX TOP VIEW 26 pin	 TOP VIEW 42 pin	 TOP VIEW 7 pin	 TOP VIEW 36 pin
CXD2024AQ	MC14066BF MC74F08DR2 MC74HC74AF	PQ05RF1	TC4S66F	$\mu$ PC339C
 TOP VIEW 80 pin	 TOP VIEW 14 pin	 TOP VIEW 34 pin	 TOP VIEW 5 pin	 TOP VIEW
CXP85460-039Q CXP85460-047Q	MN1382S	PQ12RF1	TDA4650/V4 TDA4780/V3	$\mu$ PC574J
 TOP VIEW 64 pin	 TOP VIEW 3 pin	 TOP VIEW 4 pin	 TOP VIEW 28 pin	 TOP VIEW 14 pin
CXP85112B-613S	MSP3410 P83C652FBA/532	SAA4940H-T	TDA6111Q/N4	BF550
 TOP VIEW 64 pin	 TOP VIEW 44 pin	 TOP VIEW 64 pin	 TOP VIEW 24 pin	 TOP VIEW S, D, G, C, E
CX20125		SAA4951WP/V1-T	TDA7265	DTA144EKA-T146 DTC144EKA-T146 DTC323TK 2SA1037K-T-146-R 2SA1162G 2SC2412K-QR
MARKING SIDE VIEW		 TOP VIEW 17 pin	 TOP VIEW 11 pin	 TOP VIEW C, E, B
HD14053BFP MC14053BF				
 TOP VIEW 16 pin				

DTA144ESA  
DTC144ESA-TP  
2SC1740S-R  
2SC3622A-LK



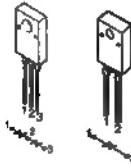
2SA933AS-QRT  
2SC2878-AB



DAN202K



D10SC4M  
D8LC40



MA3024-TX  
MA3033-L  
MA3047-TX  
MA3051M  
MA3056M  
MA3075M-TX  
MA3091  
MA3130  
RD13M-B2  
RD4.7M-B2  
RD5.1M-B2  
RD5.6M-B2  
RD7.5M-B2

IRFI640  
2SA1837  
2SC4793



2SA1013-O  
2SA1208  
2SA1208S-TP



2SA1048-YGR  
2SA1175-HFE  
2SC2785-HFE



2SA1221-L  
2SA1221-T-M  
2SB733-34  
2SB734-T-4  
2SD774-34



2SA1301-O



2SB649A  
2SC2688-LK



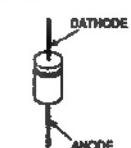
DAP202K



D6SB60L-K  
RBA-406B



D2L40F  
D2L40-TA



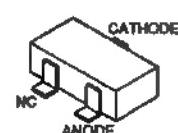
D5L60



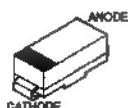
MA3091M-TX



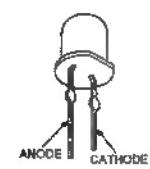
MA3240-TX



SC802-06



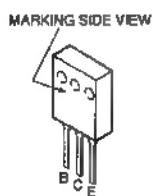
TLR124



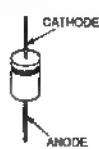
2SC1740S-R



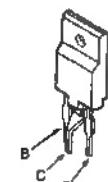
2SC3997CA



D1NL20  
EGP20G  
GP08  
GP08DPKG23  
HHT33-02  
MTZ-T-72-22A  
MTZ-T-72-33D  
RD2.0SB-T1  
RGP02-20EL-6394  
RGP15DPKG23  
1SS83



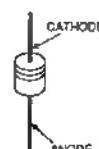
2SC4632LS-CB7



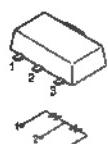
2SC4834P



D1N20R  
MTZJ-11B  
MTZJ-4.3B  
MTZJ-5.6B  
MTZJ-5.6C  
MTZJ-T-72-13B  
MTZJ-T-72-27B  
MTZJ-T-72-3.3B  
MTZJ-T-72-5.6B  
MTZJ-T-72-7.5B  
RD11ES-B1  
RD13ES-B2  
RD22ES-B1  
RD27ES-B2  
RD33ES-B2  
RD39ES-B2  
RD4.3ES-B2  
RD5.6ES-B2  
1SS119-25TG  
1SS133  
11ES2



BAS16  
BBY40



D10SC4MR



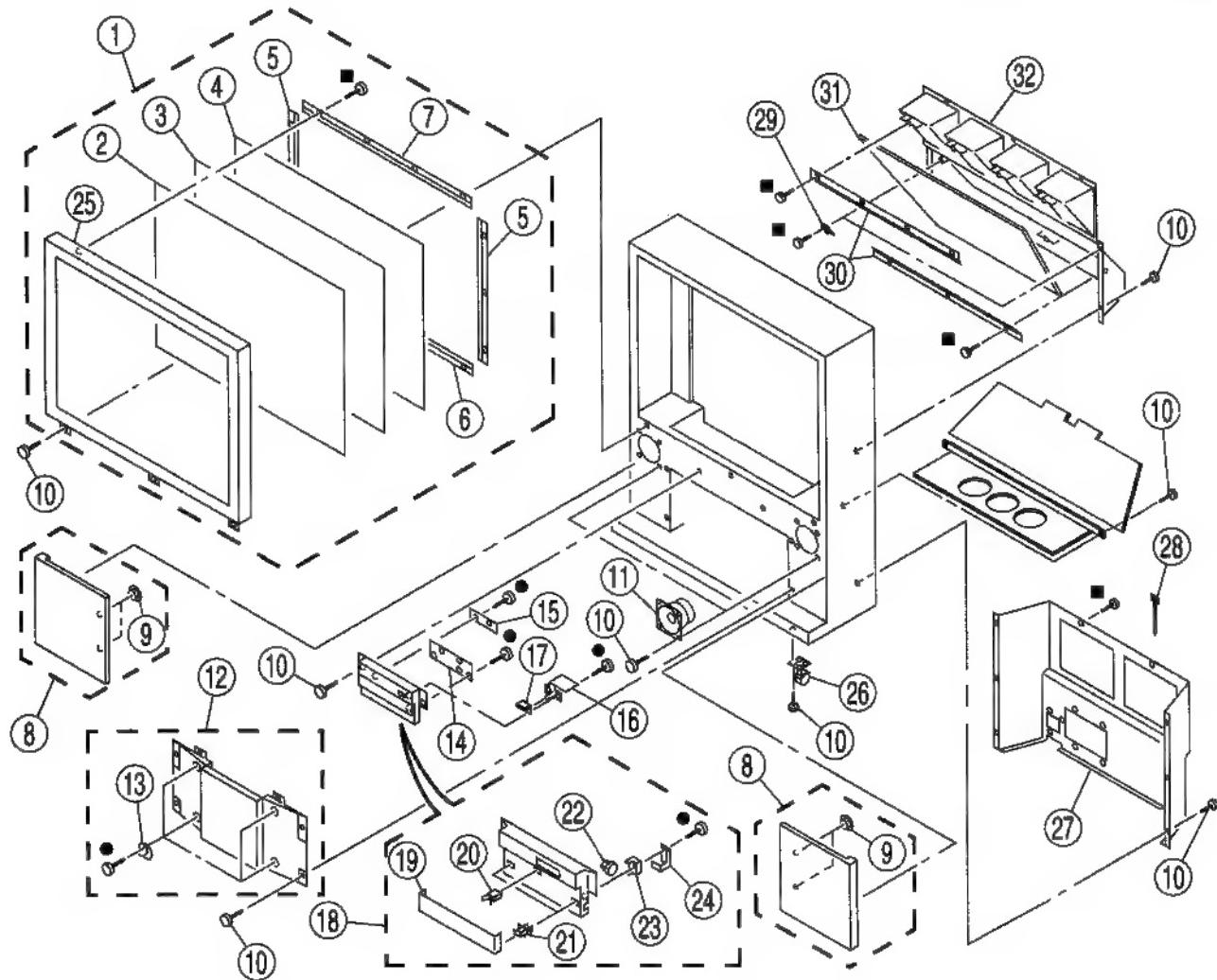
ERD08M-15



## 7-1. COVER (KP-46S4/46S4K/46S4U)

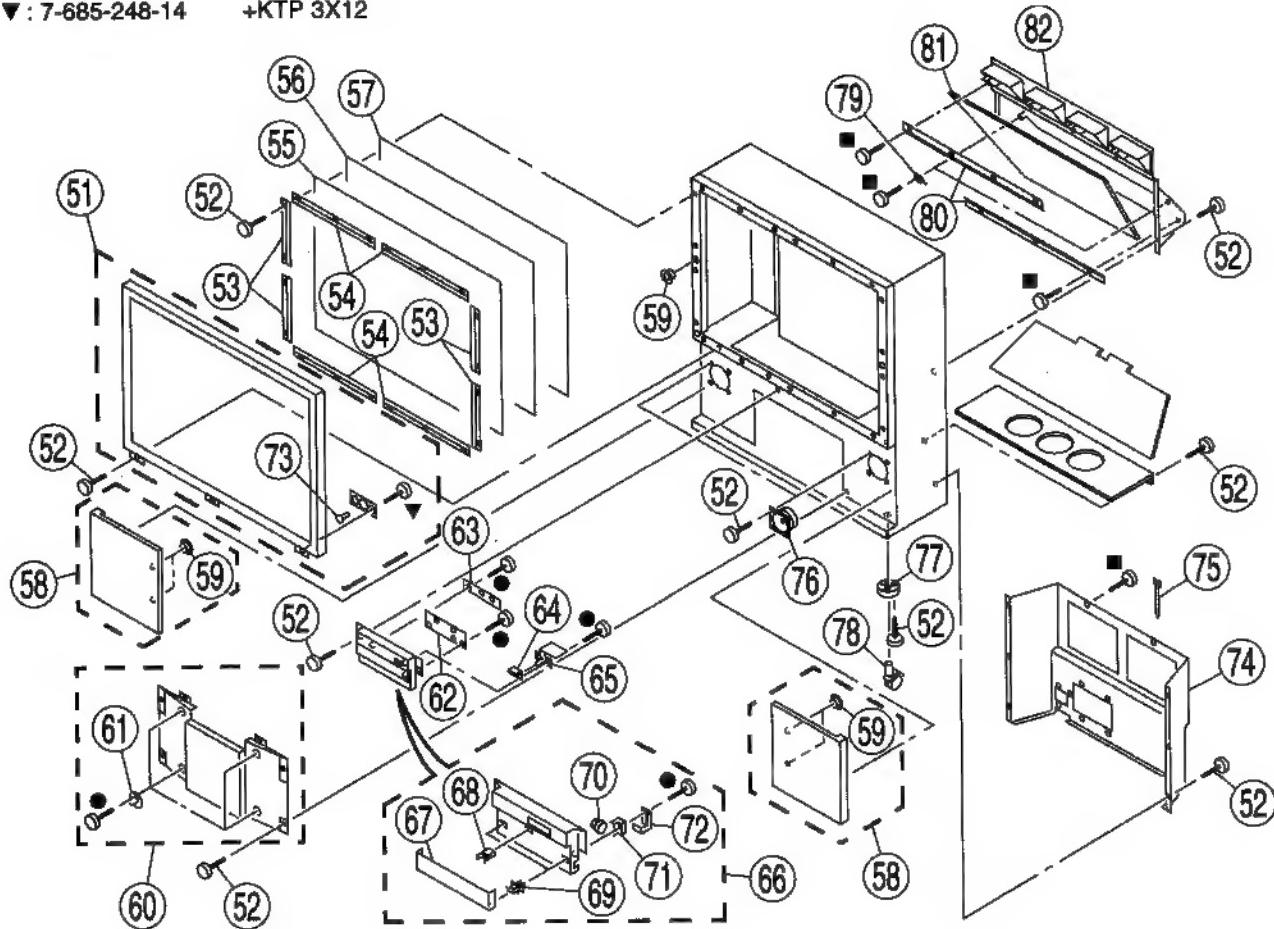
● : 7-685-648-79 +BVTP 3X12  
■ : 7-685-663-79 +BVTP 4X16

sont critiques pour la sécurité.  
Ne les remplacer que par une  
pièce portant le numéro spécifié.



## 7-2. COVER (KP-53S4/53S4K/53S4U)

- : 7-685-648-79 +BVTP 3X12
- : 7-685-663-79 +BVTP 4X16
- ▼ : 7-685-248-14 +KTP 3X12

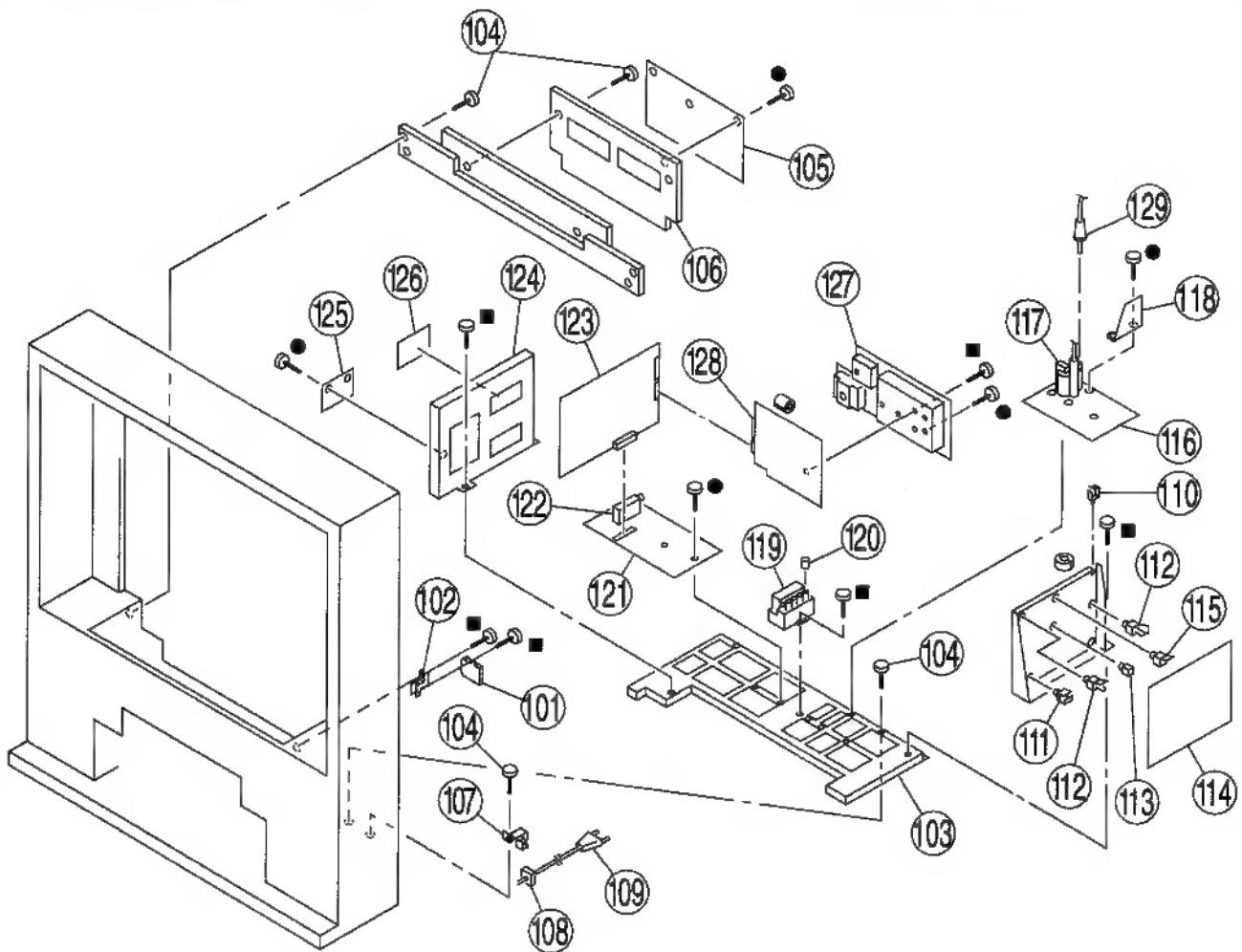


### 7-3. CHASSIS

● : 7-685-648-79      +BVTP 3X12  
■ : 7-685-663-79      +BVTP 4X16

The components identified by shading and mark ● are critical for safety.  
Replace only with part number specified.

Les composants identifiés par une trame et une marque ● sont critiques pour la sécurité.  
Ne les remplacer que par une pièce portant le numéro spécifié.



## 7-4. PICTURE TUBE

◇ : 7-685-663-71 +BVTP 4X16

The components identified by shading and mark are critical for safety.  
Replace only with part number specified.

Les composants identifiés par une trame et une marque sont critiques pour la sécurité.  
Ne les remplacer que par une pièce portant le numéro spécifié.

